THE MARINE REVIEW

VOL. 50 NEW YORK SEPTEMBER, 1920 CLEVELAND No. 9

Prevent Free Use Of Lake Ships

New American Insurance Syndicates Prohibit Their Trading In Transoceanic Routes—Discrimination Should Be Removed

IN THE fervid days of ship construction, just preceding the armistice, an incident occurred which revealed the thorough failure of many American citizens to appreciate the part shipyards and shipping companies of the Great Lakes have played and are playing in building up the country's marine strength. A report that the New York state barge canal would close a few days earlier aroused an executive officer of the Emergency Fleet corporation to telegraph to district headquarters at Cleveland to learn how this would affect scheduled November deliveries. His lifelong impression that lake trade was carried on by small power boats caused him to see nothing ludicrous in the prospect of passing these oceangoing freighters through the shallow and narrow barge canal. Similar lack of appreciation of the quality of workmanship and seaworthiness of these lake-built, salt water ships is shown frequently by experienced marine men. The belief that this is intentional discrimination is held by many business men operating around the Great Lakes. The accompanying table reveals a viewpoint on the economic possibilities of these ships which is difficult to understand or explain. Lake built ships, which have deadweight capacities up to 4200 tons, are prohibited by the new American insurance syndicate from engaging in transatlantic or transpacific trades. They were operated in such routes during the war and since and their performance is a credit to the quality of their construction. Built in great numbers, largely because of the superior efficiency of lake yards, they have been plying most of the world trade routes. Damage claims paid by underwriters have been almost entirely the result of inefficient operation. These vessels are of a size and type which is destined to play an important part in stabilizing America's marine power. They are liked by the Norwegians for Baltic and North sea service and are ideally fitted for Mediterranean, West Indian, and Oriental coastwise service, in addition to United States coastwise and deep sea trade lanes. As feeders, they fill out ideally the work of the bigger cargo carriers. Why such vessels should be the object of discrimination by American insurance underwriters is a mystery. The barrier against their free use should be removed.

Rate Schedules On Standard Type Steamships

Syndicate B (Insurance Syndicate)

Initial Rates of Premium

Without discount or refund but subject to a brokerage not exceeding 5 per cent under regulations to be prescribed by the syndicate board of managers.

Ship'g type tons deadw't	Bd. Valued at not not less than	Institute Warranties per cent	B Eastport Riv'pl'te per cent	C AGW1 per cent
11,500	$1,634,500	5½	4¾	4
10,000	1,500,000			
9,400	1,410,000			
8,500	1,275,000			
7,500	1,125,000	6	5	4½
5,000	750,000			
4,200	660,000—Note D		6	5
4,050	607,500			
3,525	528,750—Note D		6	5
2,875	451,250			

B.—Warranted confined to the waters of the American coast, not north of Eastport, Me., nor south of River Plate, including Gulf of Mexico and/or Central America and/or West Indies and/or Mexico.

C.—Warranted that the vessel shall be engaged trading between ports and/or places on the Atlantic coast of the United States of America (including ports and/or places in the Gulf of Mexico) and/or ports and/or places in Mexico and/or in Central America and/or in the West Indies and the Caribbean sea, as far south as Demerara.

D.—Prohibited from transatlantic or transpacific voyages.

Digitized by Google

World Charter Market Reviewed by

TRADE SLUMPS

Ship Tonnage More Abundant as Cargo Offerings Show Drop — Coal Restrictions Tie Up Ships

RELEASE of British shipping from government control, throwing a vast mercantile fleet on the open market; the export coal restrictions, resulting in precipitous reductions in that trade; the curtailment of Argentina's wheat exports, all coupled with a continuation of the high bunker charges contribute to darken the disturbed shipping outlook. During last month it was estimated that 100 shipping board vessels were tied up because of the fuel oil shortage. The shipping board, however, signed contracts with oil companies for a supply of approximately 26,000,000 barrels, but some of this will cost $2.60 a barrel and, furthermore, the board must charter tankers to the companies supplying the oil. In the face of such conditions, American steamship owners have shown a fighting spirit with the result that an agreement was reached with deck officers, to run another year, without an advance in wages. The longshoremen's strike at Philadelphia was practically broken and the transfer interests of New York are making some progress in establishing the open shop.

More ships have been leaving the Atlantic ports and it is reputed that cargoes have been increasing but this movement has been attributed only to a better flow of freight through the ports due to a betterment in labor conditions, and not to any increase in international trade. The coal restrictions imposed by the government have limited an important trade and rates to France dropped to $13.50 a ton. Time charter rates have dropped from $6.25 to $3.75.

New American Lines

The shipping board now owns over 3400 ocean going ships and these are not fully occupied. Within the next year, a number of new passenger steamers will be added to the list. The board announced that it will allocate 12 of these passengers to the Pacific trade, five going to the Pacific line, five to the Pacific Mail and two to the Matson line. The first will be delivered probably in October, going to the Pacific line. There is a marked surplus of cargo carriers throughout the world just now, but the demand for tankers is tremendous. The United Fruit Co. and the Pacific Mail line each purchased a 10,000-ton tanker from the New York Shipbuilding Corp. last month, paying $225 a deadweight ton, and the Tidewater Oil Co. let a contract for a tanker of like size to the Sun Shipbuilding Co. Following the announcement of the intention of the Munson line to let contracts for two new passenger boats, it was learned that the American line of the International Mercantile Marine Co. proposes to build four new transatlantic liners. These new building contracts have, it is understood, been proposed on account of that provision of the new shipping act which exempts shipping companies from the profits tax when such tax is reinvested in new shipping properties.

The United States Transport Co. is thinking of engaging in the passenger business, although it is not quite clear where it will obtain the necessary vessels. The Polish government has issued a license to the Red Star line to transact a steamship business in that republic. The GOTHLAND of that line will sail for Danzig before the end of August. The Polish-American Navigation Corp. is also contemplating the operation of a passenger service from New York to Danzig. It will attempt to obtain the tonnage from the shipping board.

The Black Diamond Steamship Co., which started as a negro venture, is sending the steamers TULSA and COLLINGSWORTH from New York and Baltimore to Antwerp and Rotterdam. The New York Oceanic Co., Inc., plans a service from both Philadelphia and Baltimore. The Caribbean Steamship Co., Ltd., will resume its regular, direct freight service from New York to Curacao and Venezuelan ports. The Five Continent Steamship Co. has established a service between New Orleans, Cartagena and Puerto Colombia. The Isthmian line has a cargo service from New Orleans and Mobile to Copenhagen. A. R. Campbell & Co., with shipping board tonnage, have announced a service from Texas ports to Genoa.

Place Liners In Service

The U. S. Mail line has obtained offices in the shipping board building at 45 Broadway, New York. These are the old offices of the Hamburg-American line. The SUSQUEHANNA of this line sailed from New York to Danzig early in August. The MOUNT VERNON is about ready to be turned over to the line, and the GEORGE WASHINGTON will soon be ready for service, while the AGAMEMNON is undergoing repairs. With the assistance of the shipping board, a new company, the Baltic line, comes into being. It will dispatch the passenger steamer, NEW ROCHELLE, formerly the POWHATAN, to Poland. This line also expects to get the MERCURY. The New Orleans Association of Commerce has announced a new line out of that port to the West coast. A general cargo service between Baltimore and gulf and Pacific coast ports will be established by the Atlantic, Gulf & Pacific Steamship Corp. The company is understood to have purchased nine steamers from the shipping board for

Sets Atlantic Record

SPEED records for Atlantic liners are threatened by the Cunarder AQUITANIA. On Aug 6, she set a new mark for short distances when she covered 129 miles in 3 hours and 42 minutes at an average speed of 27.40 knots an hour, beating the MAURETANIA'S record by more than a knot an hour. The MAURETANIA still holds the record for an entire voyage, both east and westbound between Queenstown and New York, over the northerly course of 2851 miles. Starting Sept. 11, 1910, from Queenstown, she reached New York in 4 days, 10 hours and 41 minutes at an average speed of 26.06 knots. The AQUITANIA has just been converted into an oil burner. Previously her best average was 24 knots.

Digitized by Google

this service. Merchants of Richmond, Va., have organized the Richmond-New York Steamship Co., planning to use some of the Lake type of vessels.

While overseas activities continue to incite shipping people to incorporating new maritime ventures, the coastwise business has been extremely confusing. The Mallory line was forced to suspend services at Galveston owing to the longshoremen's strike, but resumed its sailings to that port the latter part of July. This same line, however, ceased its services to Mobile because the freights offered and the rates that could be charged were not adequate to cover the cost of doing business. The congestion at Havana continues, at one time as many as 65 ships being delayed there. One of the Ward liners was delayed in Havana for 22 days.

The passenger steamer GOVERNOR COBB, has been sold by the Eastern Steamship Co. to the Peninsular & Occidental Steamship Co., and will be operated between gulf ports and Cuba. The Gulf Export & Transportation Co. has moved its offices from Beaumont to Houston, Tex. The New England Maritime Corp. has changed its name to the North Atlantic & Western Steamship Co., Boston. The Southern Pacific Co. was refused permission by the interstate commerce commission to establish a "roving" service in the coastwise trade.

Foreign Ship Firms Active

German steamship interests are apparently optimistic over the arrangements made with the Harriman group and the U. S. Mail line for the re-establishment of the old German steamship routes. They point to these agreements as the first step toward restoring foreign confidence and mutual trade relations. In accordance with the peace terms, Germany has surrendered approximately 400 ships to the allies. A movement is now on foot to re-establish the German shipbuilding industry, obtaining shipbuilding material in the United States. In view of this more favorable outlook for German shipping, the Hamburg-American and the North German Lloyd have renewed their agreement not to engage in competitive undertakings, an agreement such as they had prior to the war. It is also said that the North German Lloyd, the Hansa, the Argo and the Neptune companies plan to form a big shipping trust to exclude foreign capital. This trust is in line with Germany's new industrial policy. Furthermore reports state that the Woermann line, the Deutsche Ost Afrika line, the Hamburg-American line, the Amerika line, and the Hamburg-Bremen line, intend to resume their services to West and Southwest Africa.

These German plans are in marked contrast to the conditions in England. The English steamship owners are so concerned over the falling rates that they are beginning to cancel shipbuilding contracts which have already been let. The one development of importance during the month was the merger of the Canadian Steamship Lines, Ltd., with the $500,000,000 British Steel Corp. The Royal Mail Steam Packet Co. will soon receive some new passenger steamers for its South American service, and will have constructed some steamers for the frozen meat trade. The Canadian Pacific Ocean Services proposes to establish a service from Montreal to Danzig.

France, it is now expected, will obtain the German steamers seized by Brazil during the war. The French Compagnie Generale Transatlantique has arranged to start a monthly line from Hamburg to the western coast of South America, via the Panama canal, and also a line from Hamburg to Cuba and Mexico. This line has also advertised a service from Baltimore to French ports for general cargo. The Holland-America line will establish the Rotterdam-South America service which will call at Buenos Aires and other South American ports. In association with the Royal Packet Co., the Holland-America line will establish a freight service between the Netherlands and San Francisco and other Pacific ports, via the Panama canal.

Passenger Traffic Falls Off

The peak of the passenger traffic to Europe has been reached. For the next six weeks, the first and second class bookings show a decrease, but are expected to pick up again in the autumn. The transatlantic conference has decided to increase the third-class rates owing to the unprecedented demand. Hereafter, the minimum third-class rates from New York to Harve will be $85, to Hamburg $120, and to Danzig $135.

The West Indies market has been active and shows signs of continuing. The big demand has been for space for miscellaneous merchandise from foodstuffs to structural steel. The shipping board is planning to use some of the lake-built vessels to bring grain from the Great Lakes region to seaboard thereby removing the strain on rail transportation from the lower lake ports to seaboard.

Since the British companies have restricted their insurance activities, the movement to broaden the

RATES DECLINE

Pacific Quotations Are Easier as Less Freight Seeks Vessel Space—Boston Trade Holds Up

Exhibit War Prizes

ON AUG. 9 one of the final chapters of America's part in the world war was written at New York when five surrendered German warships anchored in the Hudson river. They were the dreadnaught OSTFRIESLAND, the cruiser FRANKFORT, and three destroyers, V-43, G-102 and S-132. The last four surrendered at the time of the armistice and were sunk later by their crews at Scapa Flow. The OSTFRIESLAND was badly damaged in the battle of Jutland. The ships will be exhibited in this country and must be destroyed within 12 months. All except the dreadnaught are in bad condition, being towed across the Atlantic. The battleship carried steam.

Digitized by Google

American business has received an impetus. It was stated that more than 50 fire and marine insurance companies have signed the marine syndicate agreement which was fostered by the shipping board. Syndicate A will make surveys. Syndicate B, the most important, has already begun to write policies. Syndicate C is yet to be organized.

Pacific Trade Unsettled

Two angles mark the charter situation in the north Pacific. One refers to the transpacific trade between ports on this side and Japan, China and the Philippines. The second has reference to the movement of freight in other directions. With respect to the transpacific routes, business is in a chaotic condition. Freights are low, bookings are light and the movement of cargo in both directions has dropped materially. Great uncertainty prevails especially because of the fear that section 28 of the Jones act will drive foreign tonnage from north Pacific United States ports.

On other routes, chartering is limited, with freights gradually declining. Not much business is being done as foreign buyers are expecting further recessions in rates and in consequence they are holding back. This is particularly true with respect to lumber. However, there is no idle tonnage in Pacific waters at present and operators appear to have little difficulty in finding employment for their carriers.

Since a month ago, when the transpacific conference reduced the rate on lumber to the Orient from $35 to $25, business has declined. In other words, the reduced rate has failed to stimulate the movement of lumber as there is little demand for it in the Far East. Japan is fully stocked for the present and financial conditions in that country are not conducive to buying in this country. The same conference reduced the rate on cotton 50 cents per hundredweight and the tariff on autos and other overland freight was cut, to place Pacific terminals on an equality with Atlantic and gulf gateways. The rate on salt fish was also cut. Flour remains at $10 per ton and steel is now being handled at $11 per ton. In other words, operators state that present tariffs are on a prewar basis, plus the increased cost of operation. The members of the conference are said to be adhering to the new tariff on the assumption that further cuts will not bring new business.

Freight Rates Drop

Vessels from the Orient are returning either in ballast or with very light cargoes. More than sufficient tonnage is available to care for the westbound movement and altogether the indications are that there will be several months of light business for steamers operating to the Far East. Reports from Japan state that vessels are already being taken out of commission because of lack of business and low charter rates. Many owners who had their carriers hired out at fancy freights during the last three years are having their vessels returned and they are now seeking tramp trades in which to operate. Chartering in Japan is said to be extremely dull.

Lumber freights to South America have dropped from $35 to $30, to Cuba from $25 to $18 and to Australia from a $35 basis to $33 and $30. Several recent charters have been done at private terms or on a lump sum basis which are usual indications of a falling market. Two large steamers have been fixed to carry railroad ties from Puget sound and Columbia river at $45 per 1000 feet while grain tonnage has been taken on a basis of $25 and $26 to United Kingdom or Continent. Several sailing ships have been chartered for barley from San Francisco or north at 150 shillings which is considered a high level. A large steamer has been fixed for flour or wheat from Portland to South Africa at 157 shillings, 6 pence. Brokers are seeking tonnage to freight coal from Puget sound to Scandinavian ports at from $20 to $23, this being business much out of the ordinary.

Admiralty control of British ships ended on July 15 and this means that considerable additional tonnage is likely to be thrown on the world's market. Western shippers are anticipating further declines in freights and this state of mind is responsible, in a large degree, for the lack of interest in the market at the present time.

Boston's Trade Holds Up

An easier freight situation has helped to increase the shipping from the port of Boston, but grain which ordinarily at this time of the year forms an important part of the port's exports has been almost entirely absent from the past month's list. Canadian grain has either been leaving from Canadian ports or from Portland, Me., or New York. Shippers claim the reason that Boston has been skipped is entirely on account of the railway situation. Manufactured products of New England have figured largely in the month's exports and increased tonnages in this line are reported by many lines.

C. H. Sprague & Co., operating lines to Scandinavia and the Mediterranean, report better conditions in both of these fields than existed a month ago. Machinery and machine tools have been in better demand from Holland and Norway. This company has recently inaugurated a new service between Boston and the Far East by way of the Panama canal. Space for England and France has been in better demand and vessels formerly forced to put into other ports to complete their cargoes have recently been sailing direct from Boston.

Exports Show Wide Range

Exports have included steel rails, heavy steel scrap, flour, shoe machinery and paper mill machinery for Scotland; shoes, machinery of various kinds, crane equipment, blowers and leather for England; tacks, nails, miscellaneous machinery, hooks, carpenter tools, asbestos and leather for Italy; sheet steel, iron bars, miscellaneous machinery, nails, tacks, arms and ammunition, automobile parts, structural shapes, wire, and lumber for Buenos Aires. Imports have fallen off in most cases but cargoes from England have been about normal with miscellaneous items including hide cuttings, paper stock, optical glass, earthenware, chalk, yarn and cotton.

Coastwise shipping has increased in spite of the small amount of coal reaching Boston from the south. The Cape Cod Canal Co. reports 951 vessels having passed through the canal during the past month. The United Fruit Co. has started a new service between Boston and the Canal zone. Shipments already made have included machinery, leather, cotton goods, shoes and other manufactured products. The service from Boston to Galveston recently inaugurated by the Clyde-Mallory line is proving highly successful. Cargo has even exceeded available space.

Digitized by Google

Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

New York to	Grain	Provisions	Cotton (H. D.)	Flour	General Cargo cu. ft.	General Cargo 100 lbs.	‡Finished Steel	Coal from Virginia cities
Liverpool	$ 0.45	$ 0.75	$ 1.80	$ 0.65	$ 0.50	$ 1.00	$10.00 T	.....
London	0.45	0.75	1.80	0.65	0.50	1.00	10.00 T	.....
Christiania	1.00	1.50	2.15	1.07	0.85	1.50	15.00 T	$14.00 T
Copenhagen	0.90	1.25	2.00	1.05	0.70	1.50	12.00	14.00 T
Hamburg	0.50	1.00	1.92½	0.85	0.65	1.25	10.00 T	14.25 T
Bremen	0.55	1.00	1.92½	0.85	0.65	1.25	10.00 T	14.25 T
Roterdam	0.50	0.75	1.57½	0.70	0.55	1.00	12.00 T	13.50 T
Antwerp	0.45	0.75	1.55	0.70	0.50	1.00	10.00 T	13.50 T
Havre	0.70	0.90	1.82½	0.90	0.60	1.25	8.00 T	12.00 T
Bordeaux	0.70	0.90	1.82½	0.90	0.60	1.25	8.00 T	12.00 T
Barcelona	30.00 T	30.00 T	2.50	30.00 T	—30.00 T—		18.00 T	15.25 T
Lisbon	30.00 T	30.00 T	2.50	30.00 T	—30.00 T—		18.00 T	13.50 T
Marseilles	0.75	1.25	1.72½	1.25	0.70	1.50	15.00 T	15.25 T
Genoa	0.70	1.10	1.47½	1.00	0.65	1.20	12.00 T	15.25 T
Naples	0.70	1.10	1.47½	1.00	0.65	1.20	12.00 T	15.25 T
Constantinople	23.00 T	28.00 T	....	23.00 T	—28.00 T—		18.00 T	17.75 T
Alexandria	....	1.40	....	20.00 T	0.62½	1.12	15.00 T	17.75 T
Algiers	....	1.75	....	1.25	0.87½	1.56¼	15.00 T	15.25 T
Dakar	23.00 T	23.00 T	....	23.00 T	—23.00 T—		20.00 T	.....
Capetown	....	....	....	30.00 T	—27.00 T—		20.00 T	.....
Buenos Aires	....	....	....	....	—20.00 T—†		12.00 T†	11.00 T
Rio de Janeiro	....	....	....	....	—18.50 T—†		12.50 T†	10.50 T
Pernambuco	....	....	....	....	—19.00 T—†		13.00 T†	11.00 T
Havana	0.55	0.63	....	0.55	....	....	0.71	.....
Valparaiso	1.25	1.25	1.16	1.25	0.65	1.16	18.00 T	.....
San Francisco	....	1.40	....	0.75	....	....	0.72	.....
Sydney	....	....	....	....	25.00 to	30.00 T	18.00 T	.....

T—Ton.

†Landed

From North Pacific Ports to	Lumber Per M. ft.
San Francisco	$ 9.00
Southern California	10.50
Hawaiian Islands	16.00 to 18.00
New Zealand	30.00
Sydney	30.00
Melbourne-Adelaide	33.00

From North Pacific Ports to	Flour Per Ton
Oriental ports	$10.00
United Kingdom	25.00
Scandinavia	26.00

‡Heavy products except rails.

From North Pacific Ports to	Lumber Per M. ft.
Peru-Chile	$30.00
South Africa	55.00 to 57.50
Cuba	18.00
Oriental ports	25.00
United Kingdom	60.00
United Kingdom (ties)	45.00

From North Pacific Ports to	Steel Per Ton
Oriental ports	$11.00

From North Pacific ports to	Cotton Per Ton
Oriental ports	$20.00 to $25.00

Principal Rates to and From United Kingdom

	Shillings
Grain, River Plate to United Kingdom	85
Coal, South Wales to the Near East	31
Coal, South Wales to Rio de Janeiro	40
Iron ore, Bilboa to Middlesborough	20
General British market, six months time charters, per ton per month	15

Rates Drop in Sagging Market

From Our European Manager

LONDON, Aug. 10. (By cable).—Freight rates show a continued tendency to soften, most fixtures now emphasizing the sagging charter market. Many American ships are returning to the United States in ballast, potash being the only cargo still available in abundance. Conditions in the River Plate trade are steadier. Demand for steamers to carry coal from Australia and the Far East to Europe has developed as a result of the curtailed production available in the United Kingdom for export. Fall grain chartering in the north Atlantic routes is being done in fair volume.

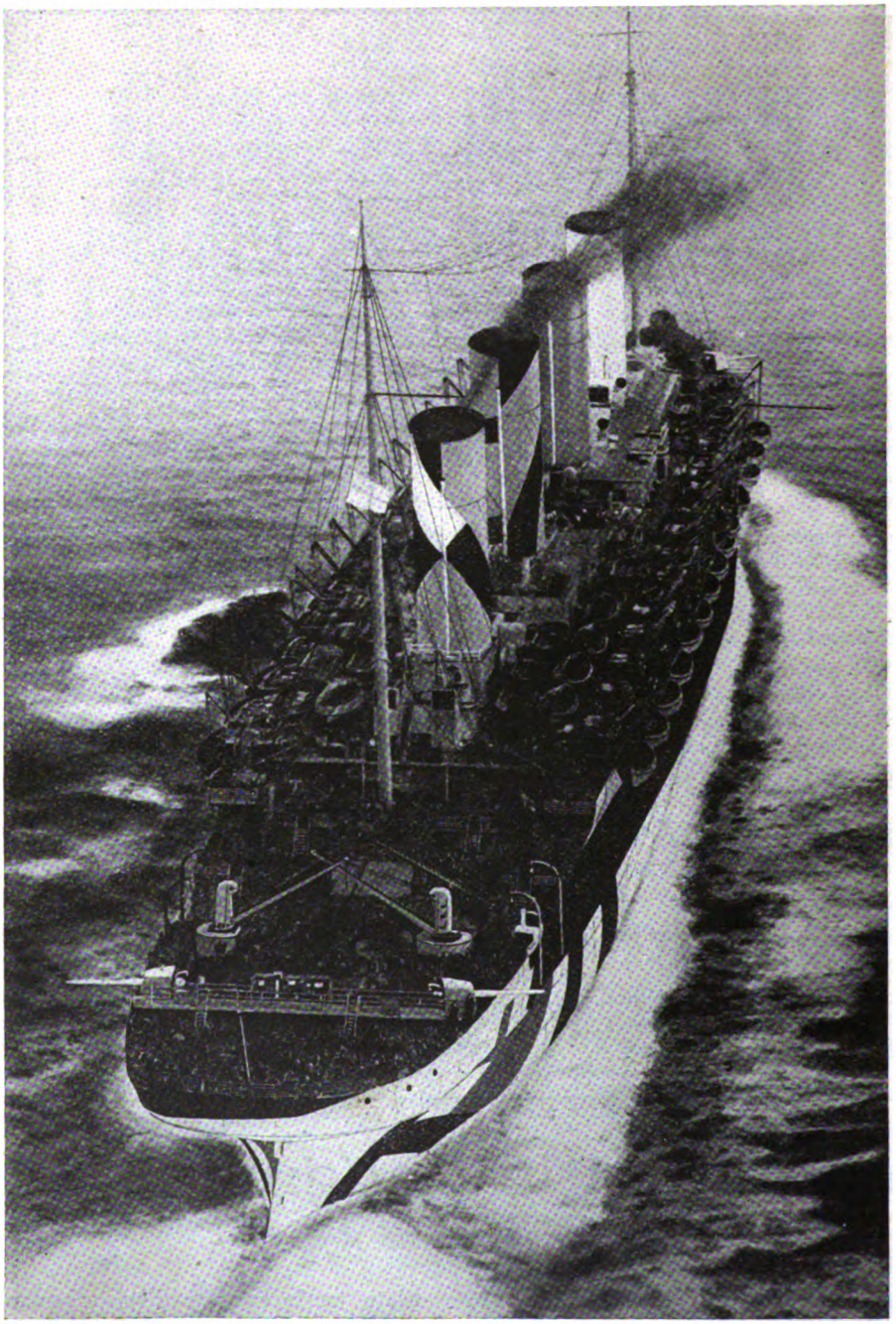
Digitized by Google

Great Liners Now Use Oil Fuel

Huge North Atlantic Passenger Vessels Finish Big Job Of Reconditioning — An Analysis of Changes Made

SHIPPING men will remember 1920 as the year oil-burning merchantmen became an actuality. The adoption of fuel oil in the engine room of ships antedated this by several years. Prior to that time, the United States had used fuel oil extensively in freight vessels but it was not until 1920 that transatlantic express steamers began crossing the ocean burning oil. This transformation was effected during a day when the constantly mounting price of oil initiated the agitation that the world's supply of the fuel would not be adequate for all the demands much longer. It required courage by the steamship owners to convert their billion-dollar properties to oil-burners under such conditions. In cargo vessels, the arguments for oil burners were that the fuel was cheaper, that the vessel would be given a greater cruising radius, that bunker space would be saved for receiving cargo, and that the time required for fueling would be lessened. In addition, the number of men required in the engine staff of an oil burner is smaller, and wages are consequently saved. Only a few of these items of economy apply to the transatlantic liners which burn oil. They do not save cargo space to any appreciable extent, and their cruising radius does not have to be increased. But the favorable factors were a more comfortable passage of the Atlantic for the passengers; a reduction in the number of men in the engine room, and a saving of time in bunkering. The transatlantic liners depend upon passenger revenues for their profits. The little freight they carry is usually of the express variety.

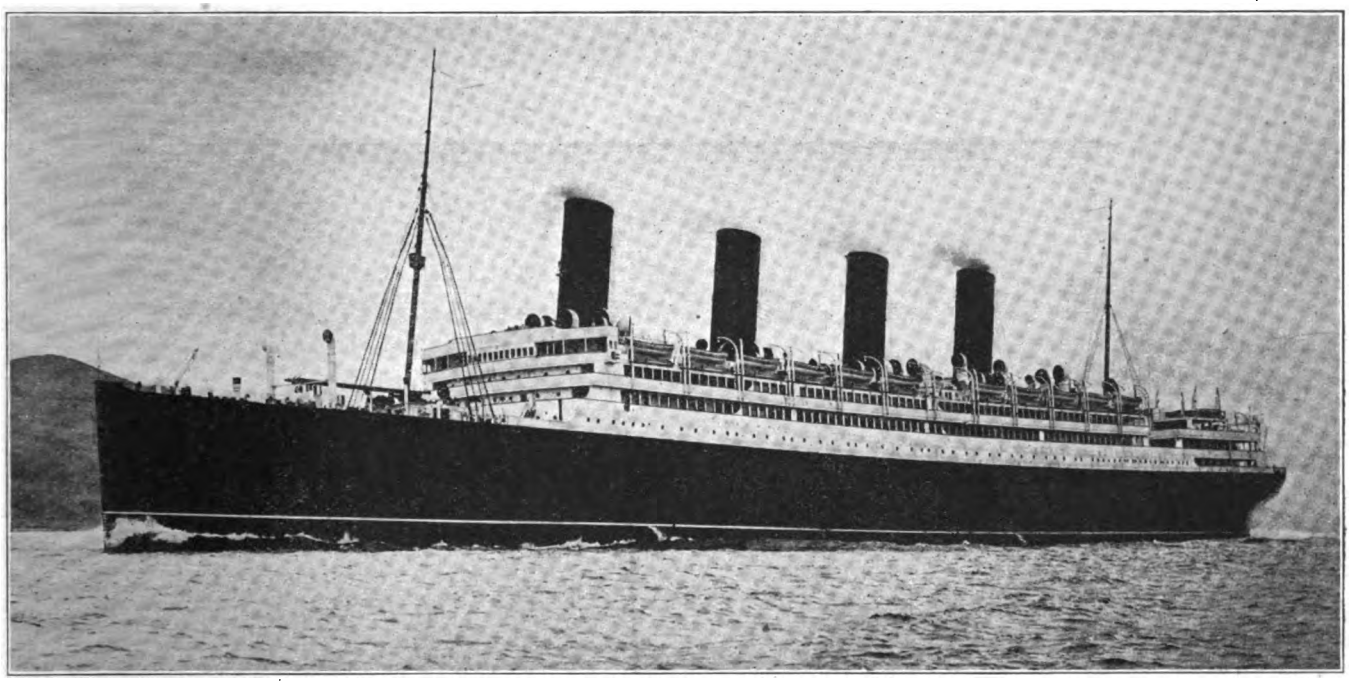
The OLYMPIC of the White Star line was the first of the ocean greyhounds to be fitted for oil. She made her first trip into the port of New York under the British flag during June. The AQUITANIA of the Cunard line followed as an oil burner the next month. These are the two prize ships of rival companies and at present the two largest passenger steamers in service. When the LEVIATHAN is converted, and it is planned that she shall be an oil burner also, the world's three largest ships will all be oil burners. The AQUITANIA is British owned and operated. The OLYMPIC is under the British flag but she is owned by an American company, the International Mercantile Marine Co. The LEVIATHAN is owned by the United States shipping board. She will surpass her two rivals in size and luxury of appointments, and she will be American operated. The OLYMPIC carries her fuel oil in her double sides, and in this respect is unique in naval architecture. On her first trip she bunkered 27,000 barrels of oil, or 5200 tons. This ship has 195 furnaces and since burning oil she saves 153 men in the engine room. She made the run across the Atlantic in seven days,



WHITE STAR LINER OLYMPIC CARRYING 6000 AMERICAN SOLDIERS

This photo was taken from a British naval seaplane. This great liner, the largest British merchant vessel afloat, has just finished conversion to an oil burner. From now on, she will sail from New York every three weeks due to greater speed in fueling. She carries 27,000 barrels of oil in her double sides

Digitized by Google



BIG LINER AQUITANIA WHICH HAS BEEN CONVERTED TO AN OIL BURNER

She has just set a new record for liners by covering 129 miles in 3 hours and 42 minutes, an average of 27.40 knots an hour, surpassing the Mauretania's record by more than a knot

which time, it is believed, can be bettered as she speeded up to 25 knots on her trials. It required several days to bunker this ship when she burned coal, but now she can be bunkered in six hours. At the same time there are no cinders or smoke to make the passage disagreeable to the passengers when on deck.

One important result of oil burning installations is the solution of the firemen or labor question on shipboard, the required number of firemen being reduced by over 70 per cent on the oil burning ship. A further advantage is that the power developed is directly under the control of the engineer and is governed entirely by the size of the burner tip, the pressure at which the pump is operated, and the temperature of the oil. In the case of the OLYMPIC, the speed of the ship was entirely dependent on the class of firemen and grade of coal obtainable. On oil feed, the speed of the ship is the limit of the engine power possible to be delivered by the engines, and this speed is maintained constantly. There are only four firemen on each watch, a reduction of over 70 per cent from the old complement.

Carries More Cargo

Although of minor importance, the OLYMPIC will be able to convert her bunker space to cargo. Adequate fuel is carried in the double sides, as only 60 per cent of the old bunkers carried will be necessary to do the same work, due to the fact that 6 tons of oil will do now equal work to 10 tons of coal.

One of the reasons for oil burning on shipboard coming to the front is the recent application of the mechanical low pressure oil burning systems, of which several have been designed. The White system is used on the OLYMPIC, it being decided that it was capable of giving the desired results in burning the heavy Mexican oils. With this system, no brickwork whatever is needed in the furnaces, which was formerly considered essential, and against the use of which there are serious objections in the Scotch marine boiler.

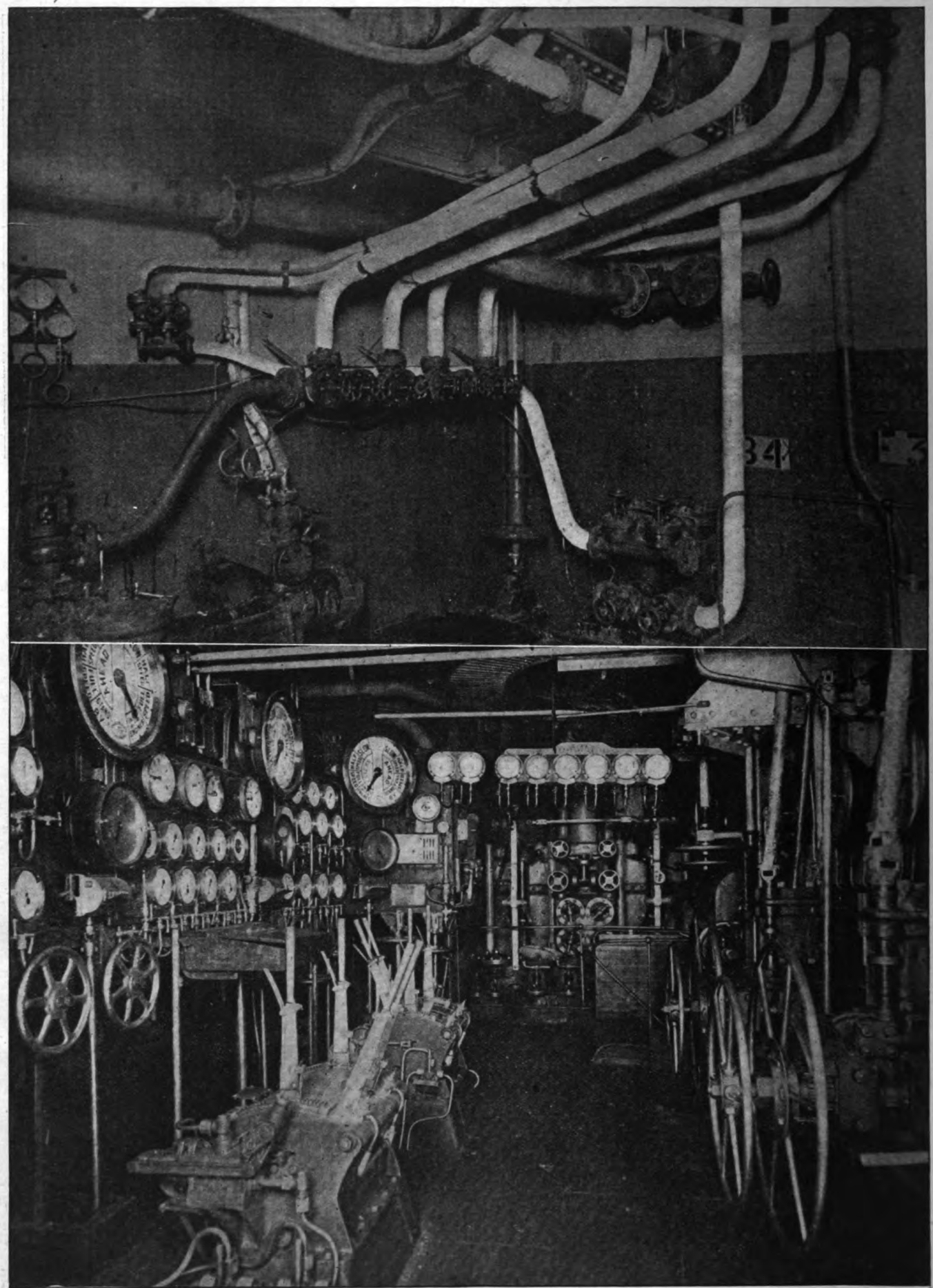
As is well known, with coal-fired boilers there is always considerable loss of steam every watch, through burning down and cleaning of fires. In the AQUITANIA, there are 168 furnaces. Assuming that 28 fires are cleaned every watch, approximately 8000 horsepower is lost every four hours. With oil-fired boilers, no such loss is incurred, as the oil can be supplied continuously to the burners, and the heating maintained so that a constant steam pressure is kept up. This will have the effect of improving the speed of the vessel. As the temperature of the boilers is maintained at a constant figure, the bill for boiler repairs will be considerably reduced. There will be no ashes to remove, and consequently no dust and inconvenience to passengers from that source. The absence of noise and dust when bunkering is also not to be overlooked in a vessel of this type and size.

One of the advantages claimed for the use of oil fuel in ships is the additional cargo space available, due to the fuel being carried in the ship's cellular double-bottom tanks. The AQUITANIA, however, is not a cargo carrier, and it was not a practical proposition to utilize the original coal bunkers for cargo purposes. As no great advantage was to be gained by using the double-bottom tanks for storing the oil, it was decided to reconstruct the coal bunkers for oil carrying.

Where Oil Is Carried

In this ship, with a beam of 97 feet, with three large double-ended boilers arranged abreast, there remains a space of about 18 feet amidships, gradually reducing to 6 feet at the forward end of the boiler space, which formed the coal bunker on each side, and in this space, extending the full length of the boiler space, a matter of 369 feet, the oil is carried. These side tanks do not form one continuous group on each side, but are broken into two groups, port and starboard, by Frahm's anti-rolling tanks, which take up 32 feet of the length. In addition to these side bunkers, large athwartship bunkers, arranged forward of No. 1 boiler room, between Nos. 1 and 2, and between Nos. 2 and 3, have also been made suitable for oil carrying. The large storage capacity in these side tanks and cross bunker tanks, however, did not prove sufficient to enable the ship to perform the double trip without requiring replenishing, so six of the double-bottom tanks have been made suitable for oil, to enable the 7600 tons of oil required to be shipped at New York. Of the total quantity,

Digitized by Google



ARRANGEMENT OF AN OIL FUEL UNIT ON AQUITANIA, SHOWING FUEL PUMP, SUCTION STRAINERS AND OIL HEATERS (BELOW) ENGINE ROOM STARTING PLATFORM

Digitized by Google

5200 tons will be carried in the fore and aft side bunkers, 1900 tons in the athwartship bunkers, and 700 tons in the double-bottom tanks. All the storage tanks, including the six double-bottom tanks, are used solely for oil, no water ballast connections being provided. These connections are usual where double-bottom tanks are used for oil, and involve many complications.

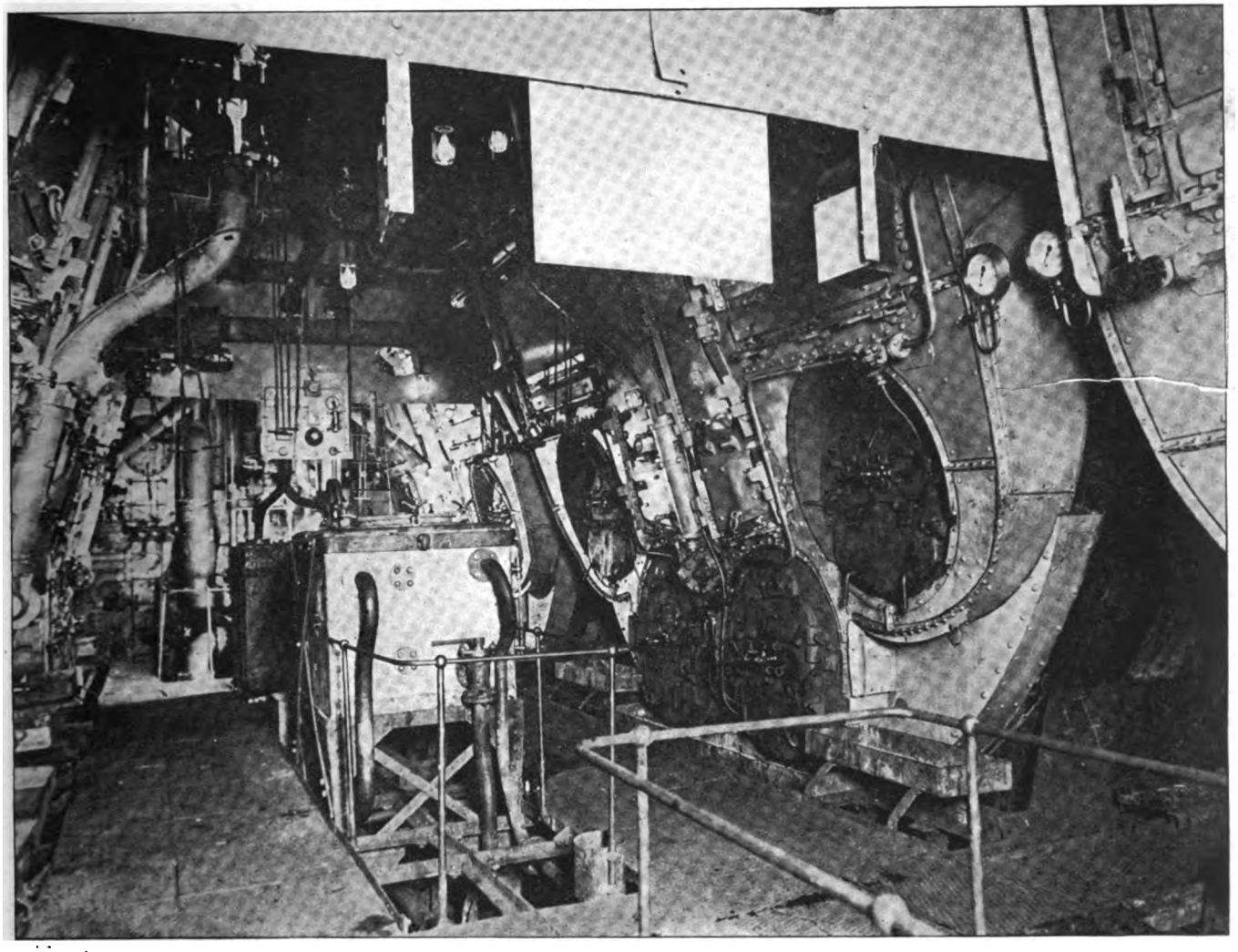
To make the coal bunkers suitable for carrying oil, a large amount of structural steel work was necessary. For instance, all the bunker bulkheads have been specially stiffened, so that deformation will not occur with the weight of oil pressing against them. All the plate joints have been specially treated, the general practice adopted being to fit stout, double riveted, joggled plate straps over each plate landing, making a thoroughly oiltight joint. Special attention has been given to plating and riveting of all steam pipe trunks and passages where these penetrate the cross bunkers.

Transverse wash bulkheads have been fitted in all the side bunkers, and suitable wash bulkheads have also been constructed in the cross bunker tanks to insure that oil is not in any way affected by the movement of the ship. For the full length of the side bunkers, and also around the cross bunkers, gutterways have been constructed to catch any oil which may find its way outside the tanks through leaky joints. In communication with these gutterways are bilge wells in each boiler room from which the oil bilge well pumps draw.

In the cross bunker storage tanks forward of boiler rooms Nos. 1, 2 and 3, four settling tanks have been constructed, each tank being of 60-ton capacity. In No. 4 boiler room, two settling tanks of similar capacity each have been incorporated in the side bunkers, one port and one starboard. In the AQUITANIA, there are four boiler rooms, the three forward ones each containing six double-ended boilers, and the after one three double-ended boilers. Two settling tanks are provided for each group of three boilers. In certain parts of the boiler room, the side bunkers overhang the wing boilers, and to insure that there will be no chance of oil dripping on the hot boiler tops, special screen plates have been fitted in way of these overhanging parts, so that any oil which may leak through will be directed to the oil gutter below.

In addition to the special riveting which has been adopted to insure oiltight joints on all the tanks, electric welding has also been largely employed, in an effort to secure a thoroughly sound and substantial tank construction. The oil fuel will be burned under the White low pressure mechanical system installed by its inventor.

The pumping, and heating plant has been supplied by Messrs. Brigham & Cowan, South Shields, England, and a complete installation in duplicate has been provided for each group of three boilers, that is, in the large boiler rooms each containing six boilers, there are four sets of pumping and heating plants, while in the small boiler rooms there are two sets. This insures that only under very exceptional circumstances will the supply of fuel to the burners be interfered with through any fault of the pumping plant. The pumping and filling arrangement throughout the ship has been prepared on a sub-



DOUBLE BOILER ROOM OF AQUITANIA SHOWING GENERAL ARRANGEMENT OF FURNACE FRONTS AS WELL AS STEAM COIL DRAIN OBSERVATION TANKS

Digitized by Google

stantial scale with a view to insuring the satisfactory operation of the ship under all circumstances. For the full length of the boiler rooms, two suction and filling mains, of 8-inch bore, are fitted, one port and one starboard. In each boiler room, these mains are cross connected, and in addition suitable shut-off valves are provided, so that the system in one boiler room can be entirely isolated from any other boiler room.

How Liner is Bunkered

Special attention was also given to the bunkering arrangements, so as to insure that the minimum of time will be required to bunker the vessel. Each boiler room is provided with two 8-inch filling pipes from the working deck, one port and one starboard. These pipes communicate with the suction mains. Special filling compartments have been arranged on "E" deck, where the connections for couplings to the tank steamer or shore hose are fitted. These compartments are entirely separate from adjoining accommodations, so that should any oil escape from the save-all trays which are fitted under the valves and strainers, the oil will not be free to spread over the deck. On each side of the ship, there are four connections for bunkering purposes.

Precautions have been taken to eliminate all possibility of overfilling the tanks. A special arrangement of air and overflow pipes has been installed by means of which should any tank be inadvertently overfilled, the oil will overflow into one of the storage tanks specially arranged for this purpose. An overflow storage tank is provided in each group of tanks in each boiler room, port and starboard. With the arrangement of overflow pipes and tanks, a sequence of tank-filling must be adhered to. These overflow connections, however, are only fitted as a safeguard should the other means provided for ascertaining the quantity of oil in the tanks fail.

Each storage tank is provided with a gage, supplied by Messrs. Kelvin, Bottomley & Baird, Glasgow, Scotland. By means of these gages, the depth of oil and quantity of oil in the tanks can be noted at any time. It is usual to fill the tanks to 95 per cent of their capacity, and this quantity is indicated on each gage. In addition to these gages, electric float alarms are fitted, so that when the 95 per cent capacity level is reached, a bell rings. No sounding pipes are fitted in any of the oil tanks.

To insure that the oil will run freely from the tanks in cold weather, or when heavy oil is being used, heating coils are fitted in all the side bunker tanks and in the double bottom tanks, but not in the cross bunker tanks, where it is considered the heating of the adjacent boiler rooms renders heating coils unnecessary.

From the storage tanks, the oil is pumped by large, vertical, direct acting pumps of Weirs' design to the settling tanks. Two of these transfer pumps are fitted in each boiler room, those in No. 4 boiler room being of 70 tons per hour capacity each, and those in the other boiler rooms of 100 tons per hour capacity each. The capacity of each settling tank is such as to insure 10 hours' supply for three double-ended boilers, so that about 15 hours will be allowed for the settling of the oil in one tank while the other tank is in use. To facilitate separation of water from the oil, heating coils are fitted in these tanks. Gages and electric float alarms are also fitted to the settling tanks. The removal of the settled water from the tanks is done by the transfer pumps, which have special connections for this purpose, so arranged that it will not be possible for the pumps to draw oil from the settling tanks and discharge it overboard.

Precautions Against Fire

From the settling tanks, the oil pressure pumps take their supply through suction strainers, discharging through the heaters and discharge filters to the burners in the furnaces. A ring main is fitted in each boiler room to which each pump unit is connected. An emergency connection is also made to this ring main so that the pressure pumps can draw direct from the oil storage tanks.

Special attention has been given to the fire extinguishing arrangement in the boiler room. With a view to speedy detection of oil on the double-bottom tank tops, a special skeleton arrangement of stokehold flooring has been fitted. Broad working gangways have been fitted in front of the furnaces, but these gangways are kept well clear of the bulkheads, leaving an open space to view the tank top and oil gutters. No wood has been used in the construction of the flooring.

The electric wiring of the boiler rooms has been rearranged to suit the altered conditions. The ventilation of each boiler room, auxiliary machinery room, passage, fan flat, tank tops, etc., has been thoroughly considered. Additional ventilating fans and trunks have been fitted. For raising steam from cold boilers, a motor-driven pump is fitted in one boiler room. When required, power can be obtained for this pump from the emergency lighting set on the ship, or from shore current supply. Hand operating, steam raising pumps are fitted in each of the other boiler rooms. Special gas exhausting nozzles and pipes with connections to the oil suction mains have been fitted to remove dangerous gases from the storage tanks before these are entered for inspection.

Critics of the steamship companies which have shown the courage to turn the greatest express transatlantic liners into oil burners declare that the oil supply of the world is not adequate to meet the present and future demand and, therefore, it is unwise for the merchant marine to place its entire dependency upon this form of bunker. These critics have been answered by William Albert White, the inventor and engineer who supervised the work on the OLYMPIC, and whose patent devices were installed on the AQUITANIA. It was largely upon the advice of such engineers as Mr. White, that the Cunard and the White Star lines consented to withdraw their prize ships from service for nearly a year so that they could be converted to oil burners.

Mr. White declares that the production of fuel oil is assured in adequate quantities. In a formal statement he issued through the White Star line, Mr. White said:

"Take the Tampico district of Mexico alone with a known petroliferous area of 12,500 square miles, of which not more than 2 per cent has been developed, and yet this development has increased the production from 78,110,000 barrels of 42 gallons in 1911, to 278,160,000 barrels in 1915, with only an occasional dry well. While this is the amount of production, only a small portion, 13 per cent, or about 36,000,000 barrels is being exported, due entirely to the shortage of transportation facilities. As these facilities can and are being increased, just so fast will oil fuel be adopted.

"The fuel oil developments of the world are considerably in excess of the amount of oil exported, due entirely to the lack of transportation. This may be readily demonstrated by taking Mexico alone, of the western hemisphere, disregarding California, Texas, Oklahoma, and last but by progress not least, Peru and Venezuela, of which large areas are petroliferous, and the figures are staggering.

Lack of Tanker Tonnage

"The present daily potential production of Mexico, but not exported, is around 762,080 barrels, or 278,160,000 barrels a year, equaling 42,100,000 tons, and this out of a very small percentage of the petroliferous area of Mexico alone. To handle this quantity would require eleven 10,000-ton tank ships to sail daily from the ports of Tampico and Tuxpam. Give each ship an aver-

Digitized by Google

age voyage of 30 days' round trip and we find it would require 335 ships of this size, or twice the world's present total oil tonnage, to transport the fuel oil of the Tampico district of Mexico alone. When it is remembered that this district represents less than 1 per cent of the world's total production, we need have no fear of the fuel oil supply for the future generation being assured and, in fact, the present potential production of the Tampico field alone is now 18 per cent of the total coal production of Great Britain. The entire situation is at the present time dominated by the number of oil tank steamers obtainable for the transportation of the oil to the markets of the world, the particular situation being that the markets are ready to accept the oil as the ideal fuel, the only requirements being:

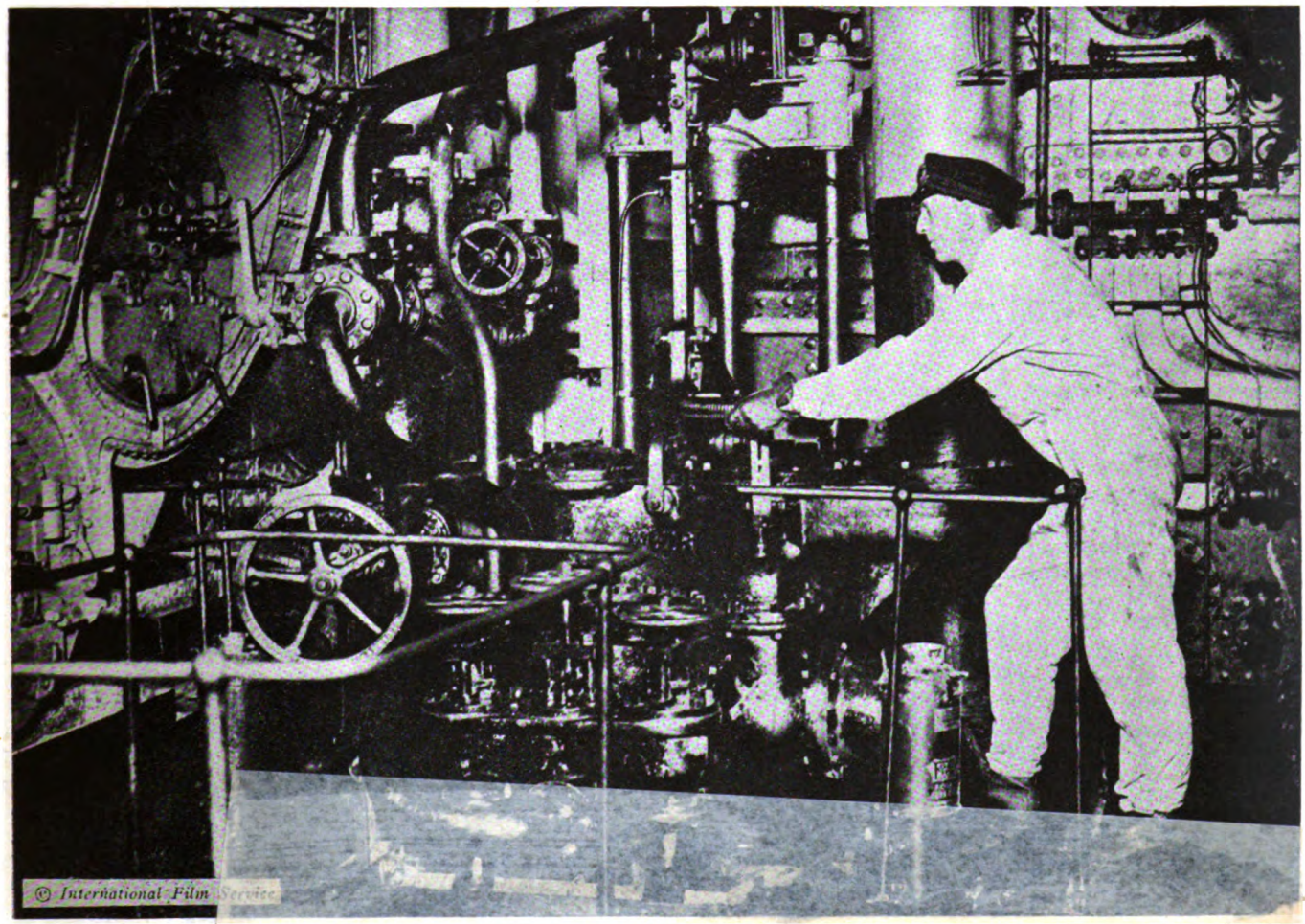
"1. A guaranteed supply of oil at the terminal plants.

"2. A retail price that readily competes with the price of coal, the purchaser being inclined to pay a little more for the oil in consideration of its many advantages both for marine purposes and for land installations.

"Both these conditions are being met, the first by the larger oil companies offering contracts of from 5 to 20-year periods, and the second by these contracts being made to compare favorably with the price of coal."

Fuel oil, of course, is not now obtained in Europe, but it is planned by the transatlantic liners to bunker all their oil in the port of New York, sufficient being taken aboard for the round trip.

Plans already drawn for reconditioning the LEVIATHAN, the largest merchant ship ever built, and which will be used in European trade, call for making the double sides suitable for carrying oil from bulkhead No. 224 to No. 245 up to "J" deck and from bulkhead No. 245 to No. 270 up to "K" deck. The double bottoms from frame No. 173 to No. 269 will be fitted for oil, and new settling tanks will be installed abreast of the boiler rooms. All the present coal ports and trunks will be retained. Where the coal trunks enter the oil bunkers the opening will be closed by an oil tight patch plate. Each fireroom of six boilers will be arranged as a



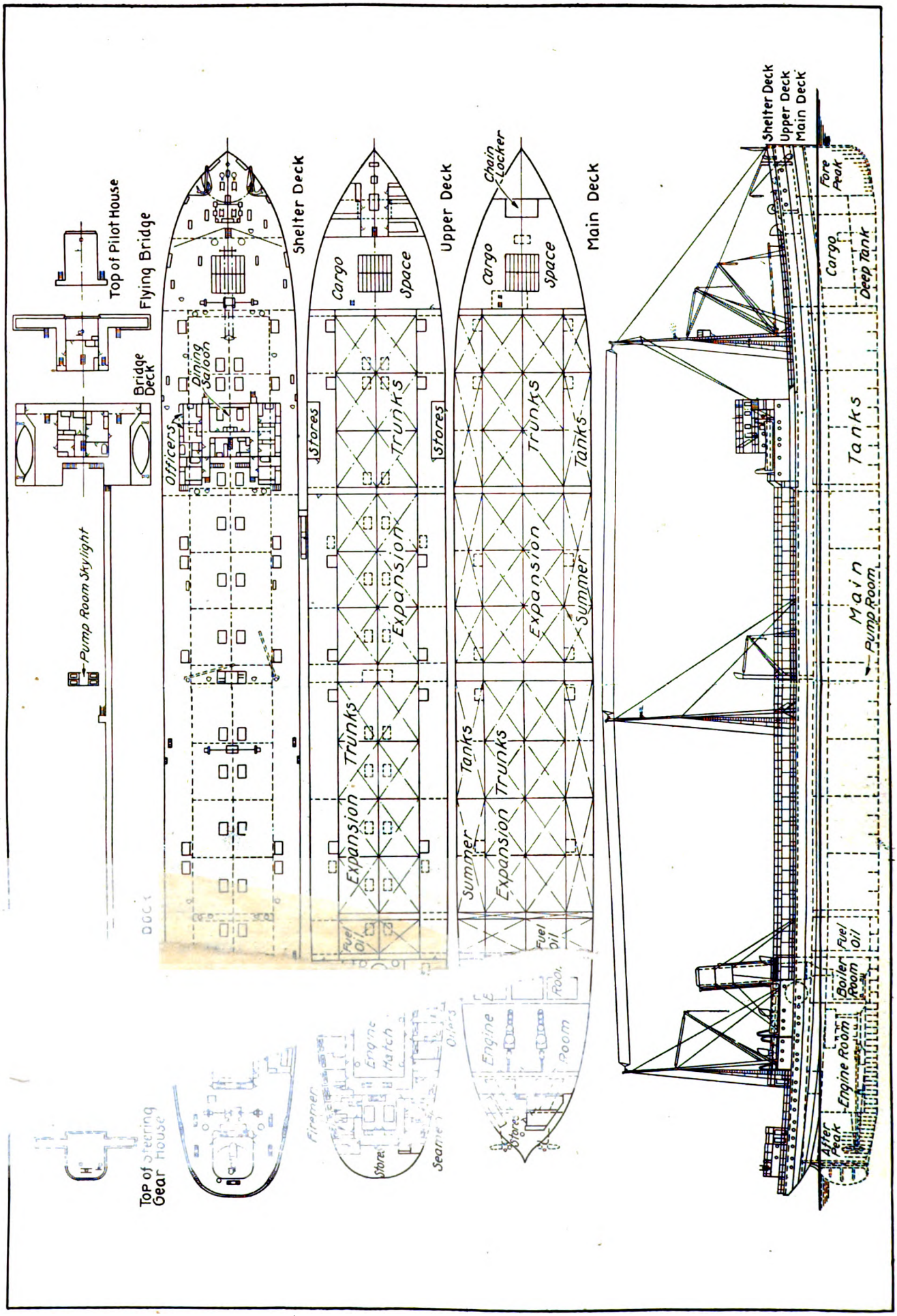
OIL TRANSFER PUMPS FOR PASSING OIL FROM BUNKERS TO SETTLING TANKS

by the ... for converting ... burner also. The actual ... such plans, very naturally, is depe... upon the final disposition the shipping ... board makes of this vessel. The Ger... mans had 141 stations in the engine room of this ship when she was first placed in service. After being taken over by the government as a transport, the navy carried a crew of 2200 men on her, but that was unusually large because she was then being operated under special precautions growing out of war conditions. To reduce her engine room staff by 70 per cent would be a tremendous saving.

The plans for converting the LEVIATHAN to an oil burner call for making ... of 65 ... ... izing burner ... the boilers, and an in... ... system will be provided for the ... ... fuel oil.

The United States shipping board has allocated the steel steamer NEW ORLEANS, constructed by the Doullut & Williams Shipbuilding Co., at New Orleans, to the J. H. W. Steele Co., of the Louisiana port. NEW ORLEANS is of 9600 tons and will be used in European trade.

Digitized by Google



GENERAL ARRANGEMENT OF 15,100-TON DEADWEIGHT OIL TANKER FOR STANDARD OIL CO.

Digitized by Google

Big Tanker Of Improved Design

Large Oil Carrier Given Greater Speed and Advanced Loading and Unloading Facilities To Cut Labor Cost

TANKER plans of the Standard Oil Co. include the construction of some of the most advanced oil carriers of the sea. The program calls for the early delivery of some of the largest tankers built, including two tankers which will exceed in size anything so far constructed in the world. The Standard Oil companies as a whole have 23 tankers under construction, the building program of the Standard Oil Co. of New Jersey being especially extensive. For this company orders call for three tankers of 10,000 tons to be built by the Moore Shipbuilding Co., Oakland, Cal.; two tankers of 10,400 tons to be built by the Sun Shipbuilding Co., Chester, Pa.; three tankers of 11,790 tons to be built by the G. M. Standifer Construction Corp., Vancouver, Wash.; two tankers of 11,900 tons to be built by the Oscar Daniels Shipbuilding Co., Brunswick, Ga., and five tankers of 15,100 tons each to be built by the Federal Shipbuilding Co., Kearny, N. J.

The five tankers building at the Federal yards are twin-screw vessels capable of making 11.5 knots on trial. In this respect they depart from the accepted plans of tankers which have heretofore been practically uniformly single-screw. The building program of the Standard Oil Co. of New Jersey, however, did not rest with the large Federal tankers but the company ordered two other twin-screw tankers which will exceed in size even the record-breaking British tankers. These two are being built by the Newport News Shipbuilding & Drydock Co., Newport News, Va., and when fully classified it is expected they will measure at least 20,000 tons deadweight and probably more. These giant tankers will measure 555 feet between perpendiculars and have a 75-foot beam. They will have a molded depth of 43 feet and a loaded draft of 30 feet. It is planned to have them propelled by two triple expansion engines of 38,000 indicated horsepower. Their capacity will be 135,000 barrels of oil.

This building program will place the Standard Oil Company in the front ranks of the great dispensors of oil of the world. It will bring under one house flag probably the largest industrial fleet in existence, for the company owned some 47 tankers before the new ships were designed. The fleet of 47 tankers already in existence includes boats of from 6000 to 17,000 tons deadweight. The Standard Oil Co. of New Jersey before the new construction plans were announced had a total of 52 seagoing vessels documented under the American flag measuring from 1000 gross tons up. The Standard Oil Co. of New York had 26 seagoing vessels under the American flag, and the Standard Oil Co. of California had 12 vessels. These fleets gave to the Standard Oil interests a power in the oil trade that was considered enviable even before the German war, but inasmuch as the Standard Oil Co. of New Jersey alone has let contracts for approximately 225,000 deadweight tons of new tankers, the prewar record will soon be surpassed.

Design of Large Tankers

In shipbuilding circles considerable interest surrounded the design of the two largest tankers which are to be built at Newport News, especially inasmuch as they are so far in advance of anything built by English yards. The designs of the tankers now under construction at the Federal yard, however, afford the key to these plans. The five tankers building by the Federal company, until the Newport News contract was let, were probably the largest tankers ever attempted in the United States. The plans and specifications prepared in this instance, it is understood, have been utilized for drafting the design of the big 20,000-ton ships.

According to the contract signed with the Federal Shipbuilding Co., the five 15,100-ton tankers to be built at Kearny will be constructed according to Lloyd's highest classification. They will measure 500 feet between perpendiculars, have a 58-foot beam, and will be 38 feet 9 inches deep. Their loaded draft will be 27 feet 6 inches. These ships will have 19 oiltight, watertight transverse bulkheads, and one continuous oiltight center line bulkhead with the usual expansion trunks. These vessels are the 3-deck, shelter deck type, and the expansion trunks extend from the main to the shelter deck.

A cofferdam forward will separate the oil cargo space from a cargo space in the prow which will also carry chain locker and stores. A pump room is located amidships and another cofferdam half-way between this and the forward cofferdam. A third cofferdam will separate the oil cargo space and the space for fuel oil, and a fourth cofferdam will separate the fuel oil space from the boiler room. The engines will be carried aft with a boat deck above, and the bridge and usual deck houses accompanying will be placed forward of the second cofferdam.

A vessel of this class will carry a crew of over 60 men and the accommodations for the men are planned according to the oil company's usual high standard. These accommodations are more than the law requires, a separate room being supplied for each officer as well as three spare rooms. Two of these spare rooms will have detached baths, and while one is assigned to a doctor and another to a purser, these officers are not normally carried on ships of this class. The wheel and chart rooms are on the flying bridge forward, below being the captain's cabin, captain's office, and the wireless room. The spares and officers' rooms and dining saloon are below the captain's quarters. The crew will be housed in the stern, over the engine room space.

Three masts will carry the antennae, the forward and the stern mast being fitted with beams and hoists.

Probably the most important feature of these tankers, however, will be the loading and unloading equipment planned for handling oil. Each vessel will have two main cargo oil pumps of the horizontal duplex type. They will be fitted with suction lines 14 inches in diameter, and be capable of discharging at least 3000 barrels per hour at a piston speed not exceeding 100 feet per minute working against a head of 100 pounds per square inch. These are the largest suction lines ever fitted on a tanker and the pumps are supposed to be the most powerful. In addition to these two main cargo pumps, each vessel will be equipped with one small stripping pump with a separate line 6 inches in diameter.

All deck machinery will be supplied by the Hyde Windlass Co. The twin wheels will be of built-up bronze. The ships will be equipped with two triple expansion engines, 20½ x 35 x 60 with a 42-inch stroke. Making 90 revolutions per minute, these engines should drive the vessels 11.5 knots. Each ship will have three Scotch single-end boilers, 16 feet in diameter and 11

Digitized by Google

feet 6 inches long. They will have a heating surface of 9576 square feet, and will be equipped with Howden forced draft and mechanical burners. In addition, one large donkey engine boiler, 10 feet 11 inches in diameter and 10 feet 10½ inches long will be provided. This boiler will have a heating surface of 1200 square feet.

The plans of these tankers were drafted by the engineers of the Federal Shipbuilding Co. in consultation with the naval architects and marine engineers of the Standard Oil Co. In many respects, the design places their ships among the first rank of tankers turned out by American yards, and makes the vessels excellent commentaries upon the standards which the industrial line attempts to maintain.

Tanker tonnage has been in pressing demand ever since the outbreak of the German war. English and other foreign yards are busy building this class of ships but it is estimated that it will be many years before the supply catches up with the demand. The Standard Oil Co. is branching out upon a program of world-wide expansion, opening new bunker stations and striving to meet the unusual demand for oil. These new ships have been specially designed larger than tankers of the past because of this increased demand for oil and the increasing distances that oil has to be carried.

The greater percentage of the new ocean tonnage constructed since the outbreak of the German war is oil burning and the demand for bunker oil for ocean navigation alone represents a tremendous demand not before experienced. The Standard Oil Co. has outlined a program for extending its bunker stations throughout the world and plans to offer bunker oil to ships plying on all the chief ocean routes. To fill this tremendous demand is proving by no means a small task especially in view of the changed attitude of labor. Owing to the high cost of labor, the newer types of Standard Oil tankers are capable of greater speed and have been equipped to load and unload much more rapidly than those already afloat. These innovations have undoubtedly enhanced the cost of the new ships but when everything is considered it is anticipated that they will prove more economical.

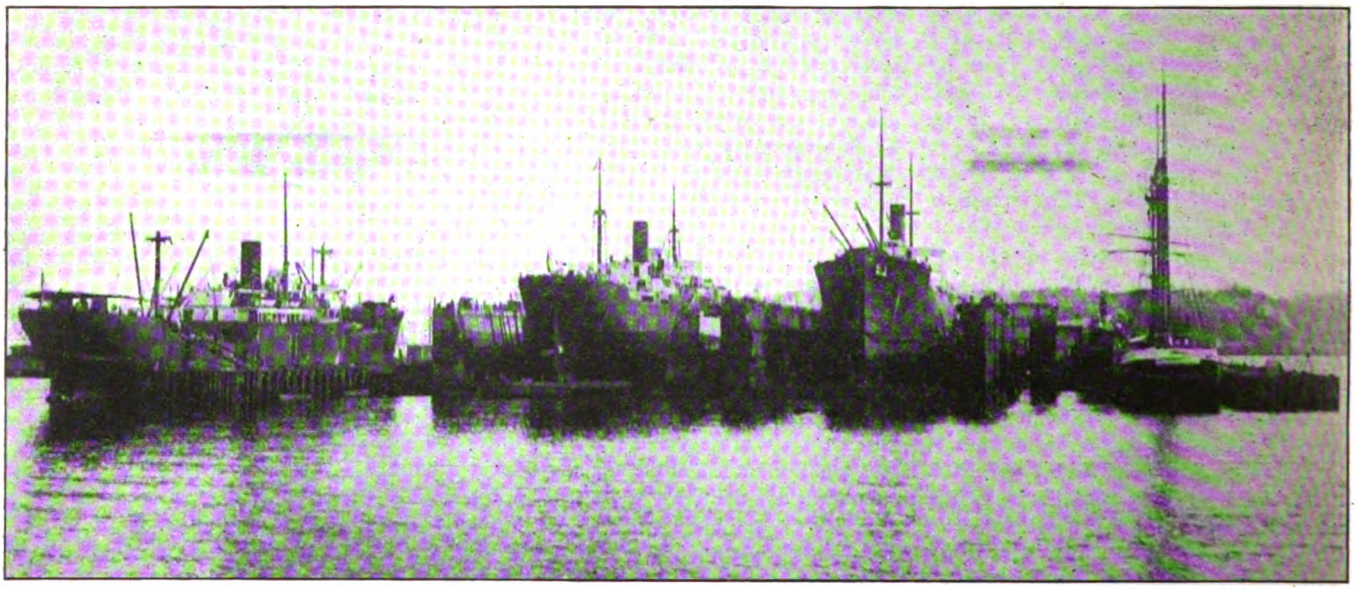
The Gulfport Shipbuilding Co., Gulfport, Miss., has obtained contracts for six large working power boats for coastwise service of the United States government. Three will be 72 feet long and three 61 feet. The boats will be equipped with high speed gasoline engines, and probably are intended as lighthouse tenders.

Turnover Shows Gain

Messrs. Armstrong, Whitworth & Co., Ltd., a large shipbuilding firm of Newcastle-on-Tyne, England, and Glasgow, Scotland, are offering for subscription £2,000,000 of 6½ per cent second mortgage debenture stock at the price of 95 per cent redeemable in 25 years. The directors state that although accounts have not been published since 1915, profits for the four years since that date have probably averaged not less than £1,000,000 per annum. The chairman of the company in a letter to the stockholders states that the present rate of turnover is three to four times that of prewar days.

Repairs Tax Capacity

The facilities of the yard and the three drydocks of Todd Dry Docks, Inc., Seattle, are being severely taxed by general repair work. This plant is receiving an increasing amount of work and the docks are constantly in demand. Several exceptionally big repair jobs have been handled this year. The accompanying photograph shows five vessels at the yards, three in dock and two moored alongside awaiting their turn. On the left is the shipping board steamer FORT WAYNE moored at the east end of the yard. Next is the shipping board steamship WEST HARTLAND in the 12,000-ton sectional drydock. The third vessel is the shipping board liner CITY OF SPOKANE sitting in the 12,000-ton steel drydock. On the right is shown a part of the local steamer POTLATCH resting in the 4000-ton dock and last is the American barkentine THOMAS P. EMIGH awaiting docking and having a new top gallant mast and yard installed. The FORT WAYNE, built by the Baltimore Dry Docks & Ship Building Co., Baltimore, underwent general overhauling after a voyage to the Orient while the WEST HARTLAND and CITY OF SPOKANE were docked and overhauled. This yard has also docked the shipping board steamer DIABLO, as well as a number of large steamers owned by private companies. In addition, Todd Dry Docks, Inc., has been awarded several contracts for remodeling steamers built in Japan for the shipping board and delivered here.



REPAIR WORK CARRIED OUT ON FIVE VESSELS AT SEATTLE PLANT

The steamer C. S. ROBINSON went ashore below West Neebish, Soo river, recently when her steering gear became disabled. Sixteen plates were damaged and she put into drydock for repairs.

Digitized by Google

Why West Coast Fears Ship Act

Pacific Marine Interests Are Alarmed by Section 28, Foreseeing Effective Retaliation By Foreign Lines

BY R. C. HILL

WHILE enthusiastic over the plans for an American merchant marine and endorsing almost in its entirety the Jones act intended to accomplish that purpose, nevertheless the Pacific coast is deeply concerned over the effects which Section 28 of that measure may have on the future of shipping from north Pacific gateways.

While it is true that Section 28 has its staunch defenders on the Pacific, the majority of shipping opinion on that coast believes that this provision of the law is likely to drive business from the Pacific coast and send foreign ships to gulf and Atlantic ports. The fact that the section in question has been suspended for the remainder of 1920 has not tended to quiet the fears of those opposed to the much discussed clause. The Pacific coast, as it views the law now, will not rest easy until Section 28 has been repealed.

Shipping men of the state of Washington are gratified that the senior senator from that state should have been the prime mover in enacting a bill so comprehensive and containing so many splendid provisions for building up and maintaining a large merchant marine under the flag of the United States. The preamble to the bill is considered an excellent outline of what the government should do for its shipping. It is a strange fact, however, that the ports of Senator Jones' own state and the adjacent commonwealths to the south, fear that Section 28 will work an irreparable injury to the shipping of California, Oregon and Washington and drive carriers to other sections of the United States.

What the West Fears

Because the position of north Pacific ports is not understood, it is not strange that the East should be surprised at the opposition on that coast to Section 28. Briefly stated this is the basis of protest:

Most of the export and import commodities passing through Pacific gateways are subject to the long transcontinental rail haul. If the preferential rail rates of Section 28 are put into effect, all the foreign carriers now operating to that coast will naturally be driven to Canadian ports where no discrimination will be practised or they will be diverted to gulf and Atlantic ports where they can compete on a parity with American vessels.

Advocates of Section 28 reply that it will be well to have none but American carriers operating out of Pacific ports. The answer to this is that ill feeling abroad will be engendered which will be reflected in discriminatory regulations against American vessels in other parts of the world. Further, foreign buyers usually nominate the carriers by which their goods shall be shipped. They will naturally favor their own ships. Thus cargo originating in the interior or close to the Atlantic seaboard will be moved to the East and then by the all-water route. The Pacific coast will thus lose its shipping. In few words, these are the outstanding arguments of both sides.

To understand the situation, it must be kept in mind that a large proportion of the cargo loaded or discharged at Pacific ports is neither of local origin nor is it consigned to local points. Consequently, much of the commerce of the Pacific gateways will be affected by Section 28. Of local cargo alone, such as lumber, salmon, salt fish, flour, fruits, coal, grain and canned milk, there is far from sufficient to fill the ship space now regularly operating out of Pacific ports. Thousands of tons of manufactured products marketed in the Orient are moved overland and shipped from the west coast. Likewise great quantities of manufactured articles or raw materials are landed there for shipment by rail to all parts of the United States.

The competition for handling this overland business has always been very keen between the Atlantic, gulf and Pacific ports. Since the opening of the Panama canal, some business has been diverted to the all-water route between the Orient and New York—business that in the days before the canal moved to Seattle or other Pacific ports. For years, special rail rates have been allowed by the railroads to permit some of this cargo, having its origin or final destination east of the Mississippi, to move across the country and through the Pacific terminals. This was advantageous to the railroads for it helped to furnish freight for their cars in both directions. The cars that came west with export steel products from the manufacturing centers near Pittsburgh returned to the East with Pacific lumber or oriental imports. Otherwise, many cars would have come west empty. These rates on through freight are in many cases considerably lower than the domestic rates on the same commodities. In this manner transpacific trade has been fostered. Some of the foreign steamship lines have for years had traffic agreements with American railroads.

This special rate structure is designed to preserve a parity of the through ocean and rail combination of rates via both the Atlantic and Pacific gateways. For its foundation, it has the rail rates between representative interior territory and New York plus the ocean rates between New York and the Orient. These tariffs are so adjusted as to enable the transcontinental lines to compete against the combination of the domestic rail rates and the ocean rates applying from points on the Atlantic seaboard. They also apply on the Canadian lines between points in the United States and British Columbia ports.

East Has Advantage

Notwithstanding the low through rates, freight designed for foreign destination naturally flows through the Atlantic seaboard and the Pacific ports have always had to meet the keenest competition from eastern ports. As an illustration the following table shows the small proportion of freight which was moved across the country as against that passing through New York. On a few of the larger items, customs reports of exports, by value, during the first quarter of 1920 show the following totals:

Commodity	From New York	From Seattle
Autos	$10,650,000	$ 120,500
Auto parts	1,300,000	30,000
Iron and steel articles	13,000,000	2,500,000
Machinery	9,000,000	750,000
Cigarets	2,000,000	730,000

It is true that during the period in question, Pacific ports were under an additional handicap because of the car shortage and railroad disturbances. All the business mentioned above originated near the Atlantic coast and was hauled to New York under regular

Digitized by Google

domestic rates. On the other hand the movement to Seattle was under export rates ranging from $1.59 to 62½ cents per 100 pounds lower than the domestic rates on the same commodities for the same rail haul. The through rates in both instances, that is, through the Atlantic and through the Pacific gateways to the Orient, were practically on a parity.

The chief benefit of these export rates is that they form the backbone for the maintenance of steamship service in the Pacific and the movement through Pacific ports has depended in a large measure on these special rates. Without the long transcontinental haul furnished by through freight, the railroads would have to move empty cars long distances thus making an increased transportation cost which would naturally be reflected in eastbound transcontinental rates from the north Pacific.

The chief indictments advanced by the opponents of Section 28 are:

1.—That it will create ill feeling with foreign nations who will not hesitate to adopt retaliatory measures against American ships when calling at foreign ports.

2.—That it is a wrong form of subsidy if it is a subsidy at all. It is agreed that American vessels must be subsidized but it is contended it should be done in such a way as not to cause international ill feeling and complications.

3.—Foreign and American ships can compete at New York and other eastern ports on equal terms; consequently shipping will be diverted from the Pacific.

4.—If Section 28 is applied, foreign ships can also be diverted to British Columbia ports and there enjoy equal privileges.

5.—Neither the shipping board nor the interstate commerce commission can control rail rates via the Canadian lines except for the small portion of the haul which is within United States territory.

6.—Much of the traffic is under routing control of interests favorable to shipping in foreign bottoms.

May Drive Ships Away

After a careful study of the situation, many of the best informed traffic men on the west coast have reached the conclusion that Section 28 will drive shipping from the Pacific ports because commerce will naturally flow to those gateways where there is an equality of competition between American and foreign bottoms. Because of the short rail haul to Atlantic ports, foreign vessels can operate from those terminals on equal terms with United States ships. With the added competition of the all-water haul via the Panama canal, Pacific ports can visualize their commerce going to eastern ports. Consequently there is a general protest against the section in question.

It is further contended that it will be impossible to prevent this disaster to Pacific ports if Section 28 is enforced, because there is no requirement compelling the railroads to give preferential rates to this import and export traffic. But if these rates are continued, the rail hauls to the Atlantic are so short and the domestic rates on such a low level that no rates could be made which would give substantial preference to American ships, operating from eastern ports, without being confiscatory. On the other hand, the Canadian lines can continue to compete with the Atlantic ports as charges added to the local rates to and from the border junctions would preserve the necessary parity between Atlantic and Pacific gateways.

Admiral Benson's somewhat belligerent statement that the interests of the Pacific will be protected has not reassured shipping men on that coast. No foreign lines will continue to operate from ports where there is a constant menace which upsets the stability of commerce when they can go elsewhere and compete on equal terms. Naturally they will take with them the business they control. This loss cannot be recouped by additional sailings of American ships.

Discount Subsidy Claim

The claim that this measure provides a subsidy is not taken seriously. Because of the short rail haul and the parity of domestic and through rates to Atlantic ports, American ships will reap no benefits on the east coast. If business is diverted from Pacific United States ports, the American vessels promised for that coast will receive no substantial subsidy. Again these preferential rail rates do not create new foreign commerce but are applied to create a parity between various gateways of the United States.

Another feature of the transpacific trade is interwoven with the question of transcontinental freight. The companies operating from Pacific ports depend in large measure on steel and cotton, coming across country, to load their vessels with the necessary proportions of weight and measurement cargoes. Local cargo alone would neither fill the fleets operating from there nor furnish the required ratio of weight and measurement.

Advocates of Section 28 state that the opposition to the section is foreign steamship propaganda, that the foreign companies, having contracts and terminal leases at local ports, will not move. Furthermore, they claim there is sufficient cargo of local origin to keep the foreign lines here. In any event, they add, if the foreign lines leave there will be an all-American fleet to serve Pacific ports.

These arguments are not based on sound logic for if the same conditions applied to all sections of the United States, the Pacific coast would have no complaint. However, it is feared that gulf and Atlantic ports will get the cargo and the ships that are now on the Pacific and it is in a spirit of self-defense that the Pacific is protesting, although in no degree impugning the motives of the loyal American senator and his colleagues who fathered the bill in a patriotic spirit of desiring to foster the American merchant marine.

Foreign Lines Hide Plans

As far as known no foreign lines have either actually moved from Pacific ports or have announced that such action will result. Representatives of foreign fleets absolutely will not discuss the matter. However, it is significant that the following notice has been served by the three big Japanese lines to the China-Pacific Freight conference:

"If the American government subjects Japanese vessels to discriminatory treatment, the Nippon Yusen Kaisha, the Osaka Shosen Kaisha and the Toyo Kisen Kaisha will immediately secede from the conference and take free action."

This has but one meaning. The Japanese are preparing to cut rates to the bone in an effort to drive American ships from the Pacific. Already one of the largest British fleets has announced a material reduction in the hemp rate from Manila.

One peculiar feature of the situation is that British Columbia interests are protesting against the alleged discrimination of Section 28 and are hoping that the law can be evaded. On the United States side, the fear is expressed that trade will be driven to Canada. Discussing the measure, the Vancouver, B. C., *Sun* outlined the British Columbia viewpoint as follows:

"By far the greater part of the transpacific freight handled through Vancouver is destined for or originates in the United States. Steel from eastern shipping points to the Pacific coast carries a rail rate of $12 per ton for export and $25 per ton domestic. The present ocean rate to the Orient is $12. Under the disputed clause steel could be shipped to the Far East for $24 per ton. The best a foreign vessel could do, if forbidden the use of the export rail rate and if the freight had to carry the domestic rate of $25 to the Pacific coast, would be $35 per ton.

"The effect of this would be to force the Canadian Robert Dollar Co., now operating five vessels out of Vancouver, to change its boats to American registry. The Canadian Pacific transpacific service would be forced to depend solely on freight secured in Canada. The Blue Funnel liners trading between here and the Orient would probably be withdrawn from service. No Japanese line could compete with the Americans."

Digitized by Google

Ship Work Ends At Hog Island

Construction Stops At Great Yard Which Proved a World Wonder—Main Achievements of Huge Plant

HOG ISLAND has finished. This spectacular shipyard built up during the war emergency to "manufacture" ships, will pass out of existence with the closing of the current year. The last of the contract vessels has been launched and will be fitted-out and turned over to the Emergency Fleet corporation by the end of the year. The American International Shipbuilding Corp., which was organized by the American International Corp. for the purpose of taking the contract with the government for "manufactured" ships, will also be dissolved immediately the work is completed. This corporation was capitalized at but $2000 and its demise is important only for the work at Hog Island.

The operating corporation originally owned the land upon which the Hog Island plant was constructed, but that property was taken over by the shipping board early in 1920. All the structures on the land were owned by the shipping board. In 1917, Hog Island was a swamp and the year 1921 may display it as one of the magnificent engineering ruins of the world war although various plans for its regeneration are advanced.

Immediately the last vessel was launched in July active work at salvaging the plant began. The derricks on the ways were shored and the hoists removed. All the lost rivets were being recovered with the use of electric magnets. The greater part of the electrical equipment of the yard was sold. All the surplus and removable material, including the material purchased to construct 35 class B ships which were not built, is to be sold.

The yard would make an excellent combination ship-repair, shipbuilding, and terminal plant by using a part of the ways for ship construction and placing one or more drydocks of large capacity where the other ways are now located. With a water frontage of 2¼ miles, the plant is excellently adapted to these purposes, but the actual fate of the yard is still in doubt. Grass is already growing in some of the abandoned ways, and the shipping board is selling to second-hand dealers everything that is removable. It is reputed that some private firms have attempted to obtain title to parts of the yard, but none of the big corporations has indicated a desire for the complete property. Apparently it is too large a proposition for any single private agency to swing, and a prospect exists that either the federal government, the state of Pennsylvania, or the city of Philadelphia will acquire title and put the plant to some commercial use.

Chairman Benson of the shipping board, after declaring that in his opinion Hog Island was one of the three big outstanding features of the war, said the plant would not be abandoned. Hog Island was a wartime project, and, as such, more than did its part in the winning of the war. Its peacetime effort to aid in establishing the American flag on the seven seas also brought to it the glory it deserves. It has amply demonstrated that quality production of ships is accomplished almost as easily as that of hair-pins, sewing-machines, bolts, or screws, and above all, it demonstrated that American ingenuity is not yet dead.

Its record is one of which maritime America may well be proud.

Hog Island's history is summarized as follows:

Sept. 13, 1917, contract for building the Hog Island shipyard signed by the shipping board.

Sept. 20, 1917, work of actually building the yard started.

Feb. 12, 1918, first keel laid.

Aug. 5, 1918, the QUISTCONCK, the first ship was launched.

By Dec. 31, 1918, 12 cargo vessels had been launched and ships in various stages of completion were on the other 50 ways.

July 21, 1920, the last vessel, the CATAHOULA, was launched, and work of salvaging the yard started in earnest.

On Aug. 1, 1920, the yard had delivered 93 of the cargo carriers to the owners.

Shipyard had 50 ways and seven fitting-out piers.

The day the last ship was launched, six others were launched with it, within the record time of 87 minutes.

A total of 122 ships were built at this yard, including 110 cargo carriers, 11 troop transports, and one navy aircraft tender.

The cargo boats, known as "A" type, measure 7825 deadweight tons each, are 401 feet long and of 54 feet beam. They are oil burners, driven by General Electric geared turbines of 2500 shaft horsepower and will make a speed of 11½ knots. The "B" type measure 8000 deadweight tons.

The aggregate deadweight tonnage launched at the plant is 956,750, nearly one-tenth of the entire tonnage of steel ships launched from all the shipyards of the United States in the same period and 50 per cent of the Delaware river shipyards' contribution to the new American merchant marine.

A Ship in 36 Hours

Employing 35,000 men and women when its operations were at the peak, the plant during the year ended July 21, 1920, launched a ship every 3⅗ working days or 28⅘ working hours and delivered a complete vessel every 4½ working days or 36 working hours.

In building the 122 ships, 356,018 tons of steel were erected and 64,573,486 rivets driven into the hulls.

Placed end to end, the 122 ships launched would reach from Market street wharf, Philadelphia, down the Delaware river to Essington, 2 miles below the shipyard, a total distance of nearly 9 miles.

July 30, 1920, 29 vessels were being outfitted in the wet basin of the plant. This work will require approximately four or five months to complete. Of all cargo carriers launched, 93 had been delivered to the Emergency Fleet corporation.

Up to July 25, 1920, the Hog Island vessels had steamed approximately 2,500,000 miles, and had carried more than 2,500,000 tons of American products to all the important ports of the world.

To this date, not a single complaint has been made against the vessels, they having delivered their cargoes safely in every instance.

The QUISTCONCK, the first vessel launched at Hog Island, has steamed 63,000 miles. She was drydocked once after covering 37,500 miles for the purpose of scraping and painting the bottom of the hull. The vessel has been in constant service without any difficulty whatever, and has never failed nor shown material, structural or workmanship weakness from the day she was launched.

The wheels of these ships make 90 revolutions per minute, reduced from 3600 revolutions. The ships each burn approximately 28 tons of fuel oil a day, and have a steaming radius of 15,000 miles. They can each carry 6000 tons of cargo.

Digitized by Google

Marine Business Statistics Condensed

New York Traffic

TRAFFIC through New York during July established a record for the year. Both overseas entrances and clearances represented an approximate increase of 10 per cent over the month previous, and the clearances were larger in number of ships and total net tonnage than the record of last January.

There is no measure of the average cost of bunker at New York, although spot bunker coal alongside was selling for from $17 to $18 a ton on Aug. 5. The price paid for coal bunker under contract by the liner companies would undoubtedly reduce the monthly average considerably. Spot fuel oil was selling for approximately $3.57 a barrel on the same date. The higher prices for bunker were due to the enforcement of the coal restrictions which the government imposed.

The larger volume of clearances was in line with the easier movement of export freight to the port by the rail lines, and the check of the longshoremen's strike. These clearances were also made possibly by a better control of bunker supplies.

NEW YORK PORT TRAFFIC 1920
(Exclusive of domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January	372	1,143,126	410	1,450,778
February	377	1,174,913	329	1,054,269
March	440	1,322,013	410	1,369,829
April	431	1,302,177	386	1,243,000
May	444	1,343,052	390	1,258,996
June	508	1,545,144	436	1,364,297
July	510	1,627,721	462	1,568,976

Philadelphia Traffic

Prior to the war, Philadelphia's port traffic was predominatingly coastwise. During the first six months of 1920, however, the overseas entrances and clearances exceeded the coastwise business, thereby ushering Philadelphia into an important position in international trade. Sugar imports continue of importance at this port but miscellaneous cargoes in both imports and exports were the general rule during July. City authorities are becoming interested in the growing trade and some steps are being taken to care for the business. Last month the mayor of Philadelphia authorized the condemnation of a group of old piers north of Market street. This property is valued at $1,250,000, and it is planned to improve the harbor front by constructing here three new double-deck piers at an estimated expenditure of about $3,000,000.

The overseas entrances during July were a good average for the year but smaller than those of either last March or last May. American vessels constituted approximately two-thirds of the entrances, and only one-fifth of these entered in ballast, whereas over one-half of the foreign entrances were made in ballast. On the other hand, the clearances during July were the largest for the year, over 50 per cent being American tonnage. Nearly one-half of the American tonnage cleared in ballast, but less than one-tenth of the foreign.

PHILADELPHIA PORT TRAFFIC 1920
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January	59	139,941	67	199,396
February	67	184,753	72	230,766
March	91	223,082	65	171,724
April	88	205,694	89	237,730
May	129	316,246	126	315,997
*June	106	251,070	75	181,975
July	91	220,223	128	343,979

*Corrected.

Bunker has been expensive, as high as $20 a ton being paid for coal. That, however, was unusual, as the average price paid for all bunker during the month was $12.48 per ton for coal and $3.41 per barrel for oil.

Seattle Traffic

The record of traffic at the port of Seattle and in the Washington customs district, including months for which figures are now available, follows:

SEATTLE PORT TRAFFIC 1920

Deep Sea Arrivals No. Ships	Net tonnage	Month	Deep Sea Departures No. Ships	Net tonnage
220	284,587	January	237	320,212
220	302,158	February	236	306,467
290	341,705	March	299	325,164
328	331,921	April	348	334,540
376	328,594	May	392	324,932
353	332,666	June	433	346,849

WASHINGTON CUSTOMS DISTRICT

	—Entrances— No.	Tonnage	—Clearances— No.	Tonnage
Jan.—American	61	87,385	196	128,962
Foreign	185	155,268	187	151,865
	346	242,653	383	280,827
Feb.—American	147	88,528	173	98,347
Foreign	183	188,174	176	168,526
	330	276,702	349	266,873
Mar.—American	185	118,794	174	107,134
Foreign	161	183,884	155	175,560
	346	302,678	329	282,694
Apr.—American	177	127,786	174	91,676
Foreign	179	153,173	168	151,652
	356	280,959	342	243,328
May—American	228	107,183	272	107,444
Foreign	188	184,458	194	181,910
	416	291,641	466	289,354

Boston Traffic

Entrances and clearances of vessels engaged in the foreign trade at the port of Boston during July were as follows:

VESSELS ENTERING AND LEAVING BOSTON PORT DURING 1920
(Offshore Trade Only)

Foreign Registry

Months	—ENTERED— No. Ships	Net Tonnage	—CLEARED— No. Ships	Net Tonnage
January	26	66,829	17	54,203
February	23	68,344	8	19,227
March	24	86,755	15	39,979
April	38	111,719	21	43,726
May	31	60,204	28	34,472
June	58	109,204	44	49,906
July	62	113,337	56	53,820

American Registry

Months	—ENTERED— No. Ships	Net Tonnage	—CLEARED— No. Ships	Net Tonnage
January	27	74,297	23	49,203
February	23	55,878	16	36,296
March	36	84,031	21	48,438
April	46	68,777	47	74,498
May	54	64,466	53	52,964
June	62	88,932	44	74,688
July	49	99,617	31	70,879

July Ore Shipments

Shipments of iron ore from the Lake Superior district during July totaled 9,638,606 tons compared with 9,173,429 tons in the corresponding period last year, an increase of 465,177 tons. Shipments to Aug. 1 are 26,079,111 tons.

Detailed figures of shipments by ports are:

Port	July, 1920	To Aug. 1, 1920
Escanaba	1,174,468	3,117,277
Marquette	610,321	1,538,724
Ashland	1,293,239	3,606,108
Superior	2,249,431	6,694,927
Duluth	2,783,537	7,000,222
Two Harbors	1,527,610	4,121,853
Total	9,638,606	26,079,111
1920 increase	465,177	897,263

Lake Erie Receipts

Out of a total of 9,638,606 tons shipped from upper lake ports in July, Lake Erie ports received 7,173,167 tons, as shown by figures compiled by THE MARINE REVIEW. The balance on dock Aug. 1 was 7,917,109 tons against 7,069,893 on Aug. 1, 1919. Details are:

Port	Gross tons
Buffalo and Port Colborne	1,550,814
Erie	321,592
Conneaut	987,500
Ashtabula	1,382,716
Fairport	224,173
Cleveland	1,256,918
Lorain	700,729
Huron	228,628
Toledo	439,827
Detroit	80,270
Total	7,173,167

FOREIGN IMPORTS, EXPORTS AND TONNAGE
Passing Through Washington Customs District

1920	Imports	Exports	Total	Entered, Tons	Cleared, Tons	Total, Tons
January	$29,964,055	$15,883,758	$45,847,813	242,653	280,827	523,480
February	40,708,726	15,989,197	56,697,923	276,702	266,873	543,575
March	46,392,720	32,780,040	79,172,760	302,678	282,694	585,372
April	32,713,226	25,156,134	57,869,360	280,959	243,328	524,287
May	38,291,480	12,299,371	50,598,851	291,641	289,354	580,995

Digitized by Google

Marine Business Statistics Condensed

Growth of U. S. Shipping

ON JUNE 30, 1920, the shipping registered, enrolled, or licensed under the American flag, according to the official returns of the bureau of navigation, department of commerce, comprised 28,150 vessels of 16,350,000 gross tons. Final returns of smaller vessels built, lost, or abandoned will change slightly these figures one way or the other, but probably not to the extent of 100 vessels and 12,000 gross tons. Since Jan. 1, 1919, closely following the armistice of Nov. 11, 1918, American shipping in round numbers has increased 5,000,000 gross tons, and during the fiscal year just ended the increase has been 3,400,000 gross tons, of which 3,100,000 gross tons are documented in the name of the government of the United States, represented by the shipping board. The accompanying table shows the main features in the growth of American shipping since Jan. 1, 1918.

The seagoing ships of 1000 gross tons or over by which the foreign trade and the more important branches of the coasting trade are conducted are separately stated. The striking feature is the growth of government ownership through the shipping board, based on the large appropriations by congress for shipbuilding and operation to win the war. Such appropriations ceased with the fiscal year just ended, and further additions to the government's fleet will require sales from the present government fleet to private owners, so that the tonnage under government ownership is virtually at its maximum. The last two columns in the table give the quarterly returns for all documented shipping of the United States, including the seagoing ships in the first four columns.

The number and tonnage of American documented merchant vessels on specified dates is given in the table.

The fleet of seagoing ships, each over 1000 gross tons, aggregating 2839 of 10,846,102 gross tons, consists of 2065 steel steamers of 9,270,418 gross tons and 377 wooden steamers of 933,424 gross tons (the small number of large motor ships being included with the steamers), and 99 steel sail vessels or schooner barges of 186,330 gross tons and 298 wooden sail vessels or schooner barges of 455,930 gross tons.

Seagoing vessels less than 1000 gross tons but over 500 gross tons not included in the table above number 565 of 432,639 gross tons. Including these smaller vessels, American tonnage on June 30, 1920, was distributed as to trade as follows: Registered for the foreign trade, 2541 ships of 9,531,190 gross tons; enrolled for the coasting trade by sea, 863 ships of 1,747,551 gross tons. The year's increase has been almost wholly in ships registered for foreign trade.

Panama Canal Traffic

Whole cargoes handled through the Panama canal during June, follow:

ATLANTIC TO PACIFIC

	No. of cargoes	Tons
Fuel oil	8	68,547
Coal	12	65,261
Structural steel	3	21,485
Petroleum	2	17,205
Sulphur	4	14,700
Sugar	2	12,164
Phosphate	1	5,858
Mixed and general	63	219,530
Total	95	424,750

PACIFIC TO ATLANTIC

	No. of cargoes	Tons
Nitrate	19	113,004
Flour	5	35,434
Cold storage food products	3	22,483
Rice	3	18,200
Lumber	2	3,773
Diesel and gas oil	1	11,071
Fuel oil	1	6,702
Sugar	1	5,825
Coffee	1	5,400
Copper	1	2,500
Mixed and general	49	185,279
Total	86	409,671

SUMMARY FOR JUNE

Number of commercial vessels	201
Registered net tonnage of above	575,027
Total cargo handled (tons)	834,421
Vessels without cargo	20
Registered net tonnage of vessels without cargo	52,890

July Lake Levels

The United States lake survey reports the monthly mean stages of the Great Lakes for the month of July, 1920, as follows:

Lakes	Feet above mean sea level June	July
Superior	602.75	602.94
Michigan-Huron	580.86	581.03
St. Clair	575.42	575.63
Erie	572.49	572.63
Ontario	245.56	245.70

Lake Superior is 0.19 foot higher than last month, 0.40 foot higher than a year ago, 0.50 foot above the average stage of July of the last 10 years, 0.88 foot below the high stage of July, 1876, and 1.46 feet above the low stage of July, 1879.

Lakes Michigan-Huron are 0.17 foot higher than last month, 0.31 foot lower than a year ago, 0.11 foot above the average stage of July of the last 10 years, 2.55 feet below the high stage of July, 1876, and 1.13 feet above the low stage of July, 1896. During the last 10 years the July level has averaged 0.1 foot higher than the June level, and 0.1 foot higher than the August level.

Lake Erie is 0.14 foot higher than last month, 0.81 foot lower than a year ago, 0.19 foot below the average stage of July of the last 10 years, 1.78 feet below the high stage of July, 1876, and 1.17 feet above the low stage of July, 1895. During the last 10 years the July level has averaged 0.1 foot lower than the June level, and 0.2 foot higher than the August level.

Lake Ontario is 0.14 foot higher than last month, 2.05 feet lower than a year ago, 1.15 feet below the average stage of July of the last 10 years, 3.02 feet below the high stage of July, 1862, and 1.11 feet above the low stage of July, 1895. During the last 10 years the July level has averaged 0.1 foot lower than the June level, and 0.3 foot higher than the August level.

Date	Seagoing of 1000 gross tons and over. Shipping board vessels Number	Gross tons	Private ownership Number	Gross tons	Seagoing and nonseagoing of 5 net tons and over, Shipping board and private ownership Number	Gross tons
Jan. 1, 1918	105	413,631	1,036	3,268,069	26,742	9,343,224
Jan. 1, 1919	608	2,305,015	1,055	3,351,841	27,217	11,261,444
July 1, 1919	982	3,827,203	1,076	3,472,819	27,513	12,907,300
Aug. 1, 1919	1,083	4,251,788	1,068	3,453,603	.....	.....
Sept. 1, 1919	1,170	4,621,502	1,075	3,478,506	.....	.....
Oct. 1, 1919	1,255	4,984,583	1,079	3,502,512	28,045	14,173,337
Nov. 1, 1919	1,355	5,397,369	1,076	3,494,494	.....	.....
Dec. 1, 1919	1,420	5,686,906	1,101	3,571,064	.....	.....
Jan. 1, 1920	1,465	5,940,742	1,119	3,648,018	28,338	15,239,288
Feb. 1, 1920	1,505	6,129,924	1,136	3,704,170	.....	.....
Mar. 1, 1920	1,516	6,248,851	1,153	3,742,682	.....	.....
Apr. 1, 1920	1,539	6,402,647	1,166	3,790,585	28,058	15,720,744
May 1, 1920	1,575	6,599,801	1,182	3,851,211	.....	.....
June 1, 1920	1,610	6,801,536	1,191	3,879,489	.....	.....
July 1, 1920	1,630	6,903,128	1,209	3,942,974	a28,150	a16,350,000

a Approximate, within about 100 vessels and 12,000 gross tons.

Lake Michigan Receipts of Iron Ore

Receipts of ore at Lake Michigan ports for July were 2,257,193 gross tons, as shown in the following record by ports:

Port	Gross tons
South Chicago, Ill.	1,051,241
East Jordan, Mich.	.....
Boyne City, Mich.	.....
Milwaukee	26,409
Indiana Harbor, Ind.	223,962
Gary, Ind.	955,581
Total	2,257,193

Digitized by Google

Marine Business Statistics Condensed

Fix Pay for Officers

DECK officers on American ships plying out of Atlantic and gulf ports have signed a new wage agreement, which became effective Aug. 1. No increase was fixed, but alterations in working rules were made to benefit the officers. Unwillingness to hamper the new merchant marine by higher wage costs was said by the officers to influence their decision to agree to the present level. The details of the agreement follow:

Wage scale and working conditions aboard ship for licensed deck officers transatlantic, Atlantic and Gulf coasts as agreed on by and between the National Organization of Masters, Mates and Pilots of America, the Neptune association, the American Steamship Owners' association and the United States shipping board.

Effective Aug. 1, 1920, to Aug. 1, 1921.

CLASSIFICATION OF VESSELS

(Figures are inclusive)

Classes	Single Screws	Twin Screws
A.....	Over 20,001	Over 15,001
B.....	12,001 to 20,000	9,001 to 15,000
C.....	7,501 to 12,000	5,501 to 9,000
D.....	5,001 to 7,500	3,501 to 5,500
E.....	Below 5,001	Below 3,501

Vessels are to be classed according to their "power-tonnage," represented by gross tonnage plus indicated horsepower as given in the latest "List of Merchant Vessels of the United States," compiled by the commissioner of navigation.

WAGES PER MONTH

Classes	A	B	C	D	E
Captain..	$412.50	$371.25	$357.50	$343.75	$330.00
1st officer	241.25	235.00	228.75	222.50	216.25
2nd officer	212 50	206.25	200.00	193.75	187.50
3rd officer	188.75	182.50	176.25	170.00	163.75
4th officer	165.00	158.75	.....	.....	.....

WORKING RULES

1—Watch and watch to be maintained on sailing day and at all outside ports and ports of call. No mate shall be required or permitted to take charge of a watch upon leaving or immediately after leaving port, unless he shall have had at least six hours off duty within the 12 hours immediately preceding the time of sailing.

2—In the home port, a day's work shall be from 8 a. m. until 5 p. m., with one hour allowed at noon for dinner.

3—If a mate is required to stay on board at night in the home port, he shall be compensated with a full day's pay additional, or in lieu thereof be given a full day off with pay. (It is the intention of this rule that no night work shall be performed by such night officer except that which is necessary for the safety of the vessel.) If during such night period, a mate is required to do any work not necessary for the safety of the vessel, he shall be paid in addition 80 cents per hour for the hours so worked, but payment for work so performed shall not be in excess of seven hours at 80 cents per hour for any one night.

4—When a night officer is furnished from shore he shall be paid at the rate of $10.60 per night for such service. Hours to be from 5 p. m. to 8 a. m. No additional compensation shall be paid when cargo is worked.

5—Any mate required to stay on board between the hours of 8 a. m. and 5 p. m. in any port on Sundays, or on New Year's day, Lincoln's birthday, Washington's birthday, July 4, Labor day, Thanksgiving day or Christmas day shall have one full day off with pay, or be paid one day's pay additional, but this shall not apply to a vessel sailing or ready to proceed on her voyage. If any of the above named holidays shall fall on a Sunday, the Monday following shall be observed as a holiday. In all ports of call and foreign ports on week days, Sundays or holidays, one mate shall be required to stay on board at night. Mates shall alternate and shall receive no extra compensation for this work.

6—Regular sea watches to be maintained at outside ports or in port of call, provided, however, that, with the consent of the master, the mates shall make a mutual agreement relative to the night watch.

7—While at sea, no mate shall be required or permitted to perform any duty in excess of 8 hours out of 24 hours, except that actually required for the safety of the vessel. (This rule does not apply on routes of 400 miles or less from port of departure to port of final destination.)

8—When subsistence is not provided on board, master shall be paid $4.50 per day and mates $3 per day subsistence allowance. When rooms are provided aboard ship they shall be properly equipped with light, heat, water, linen and service. Where no room is provided on board, the master and the mates shall receive $2.50 per night room allowance. Employers shall furnish first class transportation and full pay to master and mates when traveling to join a ship or returning home in compliance with orders. When traveling by rail, berth to be provided, also subsistence allowance of $5 per day. This rule shall also apply to vessels sold or for any cause put out of commission, except by shipwreck.

9—A ship lying at anchor in a home port awaiting berth before her voyage has been ended shall have sufficient mates aboard at all times for the safety of the vessel. If, however, more than one mate is required to remain on board at night, the off-watch mate shall be compensated as per Rule 3.

10—If a mate is required to remain on board ship at night while lying at anchor in a home port awaiting berth, after her voyage has ended, he shall be paid in accordance with Rule 3. The voyage of a vessel shall be considered to be ended when the vessel is safely berthed, or the crew paid off.

11—In cases where a vessel is short of her complement of mates, except in cases of sickness, the wages of the mate short shall be divided equally between the two mates standing his watch.

12—The master shall daily make an inspection of the ship, and particularly of the living quarters of the crew.

13—Overtime work performed by mates shall be first authorized by the master, and upon completion of the work the mates shall be given slips stating the amount of overtime worked and an entry also made in the official log-book, it being understood the overtime rate shall be 80 cents per hour.

14—Authorized representatives of the Masters, Mates and Pilots' association and Neptune association shall be granted permission to visit vessels when presenting a pass signed by the owner at time of paying off and at such other times as are agreeable to the representatives of the owners, but under no consideration shall representatives of the organizations interfere with the men at work.

15—If a mate is absent from duty during working hours, except as compensation for overtime service, when the vessel is in port, the amount he would have earned during such absence shall be deducted from his wages on the basis of the daily rate of pay.

16—This wage scale and these working rules shall take effect Aug. 1, 1920, and shall continue in full force and operation until Aug. 1, 1921.

NOTE:—A "home port" shall be considered to be the port at which shipping articles are opened, or the port at which crew is paid off upon completion of a voyage.

NOTE:—Should any dispute arise during the life of this agreement, as to interpretation of same, the matters in dispute shall be submitted to a committee of three representatives of the Masters, Mates and Pilots' association and Neptune association, and three representatives of the American Steamship Owners' association (who shall also be managing agents of shipping board vessels), with Winthrop L. Marvin as chairman; decisions of the committee to be final.

NATIONAL ORGANIZATION OF MASTERS, MATES AND PILOTS OF AMERICA,
John H. Pruett,
D. W. Pratt.

NEPTUNE ASSOCIATION,
A. N. McGray,
E. M. Foster,
F. T. Burkhart.

AMERICAN STEAMSHIP OWNERS' ASSOCIATION,
A. J. McCarthy,
Vice chairman, committee on wages and working conditions aboard ship.

UNITED STATES SHIPPING BOARD,
Bruce Gibson,
Marine superintendent, division of operations, New York.
(Subject to final approval of the board.)

World's Tanker Fleet

Number and tonnage of tankers owned by the different nations of the world on June 30, 1914 and 1919, are shown in a table recently compiled by the bureau of navigation, department of commerce. The records for the United States are brought up to May, 1920. The table is given above.

Flag	On June 30, 1914 Steam No.	Steam Gross	Sail No.	Sail Gross	Total No.	Total Gross	On June 30, 1919 Steam No.	Steam Gross	Sail No.	Sail Gross	Total No.	Total Gross
American	55	201,160	30	60,207	85	261,367	a190	1,022,551	b72	101,364	262	1,123.915
Belgian	10	25,981	..	.....	10	25,981	8	28,543	..	.....	8	28,543
British	c181	819,993	7	21,561	188	841,554	d262	1,326,718	5	11,345	267	1,338,063
Chilean	1	2,197	..	.....	1	2,197	...	.....	1	2,583	1	2,583
Cuban	..	.....	..	.....	...	.....	...	.....	1	1,763	1	1,763
Danish	..	.....	1	735	1	735	...	.....	1	731	1	731
Dutch	27	83,294	8	8,642	35	91,936	30	83,532	6	5,982	36	89,514
French	e3	11,232	..	.....	3	11,232	5	20,145	1	3,203	6	23,348
German	45	204,849	1	728	46	205,577	10	37,561	1	728	11	38,289
Greek	1	1,633	..	.....	1	1,633	...	.....	..	.....	...	.....
Italian	4	18,099	..	.....	4	18,099	5	26,183	..	.....	5	26,183
Japanese	5	21,887	..	.....	5	21,887	2	2,607	..	.....	2	2,607
Mexican	4	13,464	..	.....	4	13,464	3	11,199	1	1,342	4	12,541
Norwegian	2	4,728	1	1,254	3	5,982	14	68,331	..	.....	14	68,331
Rumanian	2	8,390	..	....	2	8,390	1	3,051	..	.....	1	3.051
Russian	6	14,371	..	.....	6	14,371	6	13,805	..	.....	6	13,805
Spanish	1	672	..	.....	1	672	...	.....	..	.....	...	.....
Total	347	1,431,950	48	93,127	395	1,525,077	536	2,644,226	89	129,041	625	2,773,267

	May 1, 1920 Steam No.	Steam Gross	Sail No.	Sail Gross	Total No.	Total Gross
American	227	1,276,108	f 73	105,369	300	1,381,477

a Not including navy tankers; 14 vessels, 93,669 gross tons.
b Including 29 barges, 23,526 gross tons.
c Not including British navy tankers; 2 vessels, 6518 gross tons.
d Not including British navy tankers; 34 vessels, 66,809 gross tons.
e Not including French navy tankers; 1 vessel, 5179 gross tons.
f Including 30 barges, 24,362 gross tons.

When the Pacific Steamship Co. takes over its new passenger liners WENATCHEE and KEYSTONE STATE, it is planned to bring out two large parties of sightseers to the Pacific coast. E. G. McMicken, general passenger agent of the line, has gone to the Atlantic to make the preliminary arrangements. These vessels and others are to be operated in the Oriental route out of Seattle including Japan, China, Siberia and the Philippines.

Digitized by Google

Marine Business Statistics Condensed

World's Shipbuilding

ALTHOUGH nearly a million and three-quarters gross tons less of shipping are being built in the United States today than a year ago, the reduction in the world total under construction is less than 4 per cent, says a statement just issued by Lloyd's *Register of Shipping*. Returns from all countries for the quarter ended July 1 show an aggregate of 7,720,000 tons under way, compared with 8,017,000 tons at this time last year.

The sharp decline in American building has been almost completely offset by gains made by practically all the other maritime countries. On July 1, 1920, there was under construction in the United Kingdom more than a million gross tons in excess of the July 1, 1919, figure, while all other countries combined, exclusive of the United States, showed an increase of over 400,000 tons. The American aggregate of 3,874,000 tons a year ago has now declined to 2,105,000 tons.

Today, therefore, according to the returns, the United States is building 1,472,000 tons less than the United Kingdom, whereas, a year ago America led by 1,350,000 tons. At the same time the lead held by American shipyards over those of other countries, Great Britain excluded, has been pared down so rapidly that the American margin of 2,254,000 tons on July 1, 1919, has now been reduced to less than 70,000 tons. The rapidity of the shrinkage in shipbuilding in this country is indicated by the fact that almost up to the beginning of this year, the United States was still leading the United Kingdom.

A notable feature of the returns from all countries is the indication that the United States is taking effective steps to remedy its shortage of larger sized vessels. The 366 steel steamers building in American yards represent an average per ship of 5609 gross tons, as against 4012 tons for the 888 British vessels and 2985 tons for the 655 building for the rest of the world. Rapid elimination of the wooden steamer from the American shipbuilding program is shown in the report that only 29,000 tons of this class of vessels are now being built in this country. A year ago 420,000 tons were under construction here.

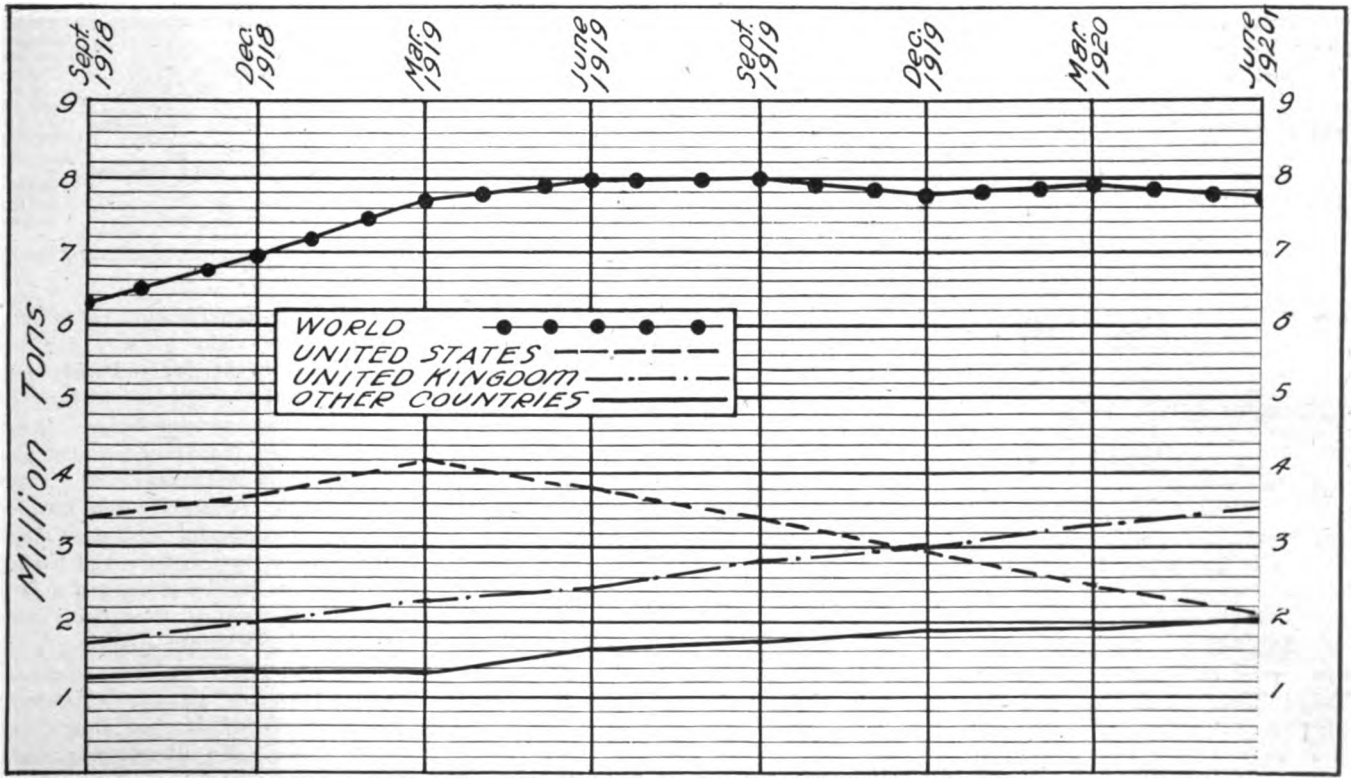
The present returns of Lloyd's *Register*, taken in comparison with those for the quarter ended April 1, last, show a decrease of about 221,000 tons in the world's total and a decline of 328,000 tons from the record figures reached at the beginning of last October. For Great Britain a gain of 184,000 tons is shown over the April figure, while the United States aggregate under construction dropped 467,000 tons. Other countries showed an increase of 63,000 tons.

More than 97 per cent of the American total now building is composed of steel steamers and more than two-thirds of these are being constructed in Atlantic coast shipyards. The following table shows the distribution by districts in gross tons for the quarter just ended and the previous one:

	July 1	April 1
Atlantic coast	1,352,750	1,585,827
Gulf ports	181,841	180,793
Great Lakes	95,201	173,375
Pacific coast	423,124	478,163
Total	2,052,916	2,418,158

The largest total for any district in the United Kingdom is that for the Clyde, where there are now 1,260,000 tons under way. The aggregate British output for the quarter ended July 1 was 69,000 tons greater than that for the preceding quarter and the aggregate of new contracts on which work was begun was 588,000 tons. This latter includes many large vessels. There are now under way, in addition to a great number of small vessels, 63 of 10,000 tons and upward.

How the United States and the Unit-



WORLD SHIP CONSTRUCTION RECORD FOR PAST TWO YEARS

Digitized by Google

Marine Business Statistics Condensed

ed Kingdom have stood since the period of the armistice in relation to tonnage of all types under construction is shown by the following table, giving the totals at the end of each quarter in gross tons:

	United States	United Kingdom
Sept. 30, 1918	3,382,000	1,746,000
Dec. 31, 1918	3,645,000	1,979,000
March 31, 1919	4,185,000	2,254,000
June 30, 1919	3,874,000	2,524,000
Sept. 30, 1919	3,470,000	2,816,000
Dec. 31, 1919	2,966,000	2,994,000
March 31, 1920	2,573,000	3,394,000
June 30, 1920	2,105,000	3,578,000

Distribution of the construction of steel steamers in the past two quarters has been as follows, in gross tons:

	July 1	April 1
United Kingdom	3,563,251	3,379,731
United States	2,052,916	2,418,158
Other countries	1,955,771	1,894,880
Total	7,571,938	7,692,769

The United States and the United Kingdom are still far ahead of all countries in the amount of shipbuilding under way. Holland, which stands third, with a total of slightly less than 400,000 tons, shows a gain of about 32,000 tons over the previous quarter. Canada in the same period gained nearly 40,000 tons, France 25,000, Sweden 7000, Denmark 3500 and Spain 3000. France, which had stood sixth in amount of building, now ranks fifth, having taken the place of Japan, which showed a decrease of 31,000 tons from the previous quarter and now has under way only about 250,000 tons. The distribution of the world's shipbuilding on July 1, as compared with the preceding quarter, was as follows, in gross tons:

	Tons July 1	April 1	Gain or loss
United States	2,105,956	2,573,298	—467,342
United Kingdom	3,578,153	3,394,425	+183,728
Canada	209,405	169,623	+39,782
Other dominions	59,394	61,636	—2,242
Belgium	24,210	25,640	—1,430
Brazil	3,196	5,366	—2,170
China	29,850	35,325	—5,475
Denmark	118,439	114,851	+3,588
France	265,302	240,225	+25,077
Greece	1,500	1,500	.....
Holland	398,915	366,581	+32,334
Italy	353,914	355,241	—1,327
Japan	254,260	285,676	—31,416
Norway	87,579	90,449	—2,870
Portugal	3,500	5,210	—1,710
Spain	101,432	98,351	+3,081
Sweden	125,899	118,553	+7,346
Total	7,720,904	7,941,950	—221,046

In comparison with the above figures, it is interesting to note that just before the outbreak of the war, on July 1, 1914, the total tonnage building was 3,162,000 tons, of which 1,722,000 tons were under construction in the United Kingdom, and 1,440,000 tons in other countries, the United States' share being only 148,000 tons. Of the 1914 total, 1,865,000 tons were building under the supervision of Lloyd's *Register*, or 59 per cent of the prewar aggregate.

Compared with the prewar figures, the present American tonnage is 1,957,000 tons greater, that of the United Kingdom is 1,856,000 tons higher and the world's total shows an increase of 4,558,000 tons. The tonnage now building under the supervision of Lloyd's *Register* aggregates 4,930,000 tons, of which 2,797,000 tons is in the United Kingdom and 2,133,000 tons in other countries, the total being an increase of 164 per cent over the prewar total. Lloyd's *Register* today is classifying 64 per cent of all the tonnage building in the world.

Soo Canal Report

The total movement of freight through the Soo canal for July was 11,577,679 net tons, which is an increase of 929,860 tons over the amount carried in June. When compared with the shipments for July of last year, which were 11,916,152 tons, a decrease of 338,473 tons is shown. The tonnage comparison figures for the past seven years follow:

July, 1920	11,577,679
July, 1919	11,916,152
July, 1918	13,362,344
July, 1917	13,650,047
July, 1916	14,048,494
July, 1915	9,719,237
July, 1914	8,830,256

Of the total freight carried in July, 11,311,310 tons were handled through the United States canal, while 266,369 tons passed through the Canadian canal.

The following tabulation gives the figures in detail for 1920 and 1919:

	To Aug. 1, 1920	To Aug. 1, 1919
EASTBOUND		
Lumber, M. ft. B. M.	84,005	116,505
Flour, barrels	2,912,681	2,857,574
Wheat, bushels	31,587,201	54,619,007
Grain, bushels	24,123,347	27,341,324
Copper, net tons	15,707	17,613
Iron ore, net tons	24,788,886	24,679,059
Pig iron, net tons	95	3,373
Stone, net tons	29,275	21,800
Gen'l merch., net tons	27,529	36,107
Passengers, number	15,595	13,633
WESTBOUND		
Coal, soft, net tons	2,842,750	6,959,811
Coal, hard, net tons	783,170	962,789
Iron ore, net tons	48,443	45,949
Manufactured iron and steel, net tons	40,999	61,008
Salt, net tons	44,509	45,545
Oil, net tons	147,402	194,418
Stone, net tons	205,734	58,650
Gen'l merch., net tons	228,763	196,664
Passengers, number	16,409	14,073
SUMMARY		
Vessel passages, number	8,091	9,197
Registered tonnage, net	24,872,605	26,296,516
Freight:		
Eastbound, net tons	26,842,147	27,550,183
Westbound, net tons	4,341,770	8,524,874
Total freight, net tons	31,183,917	36,075,057

New Shipping Firms

Authorized capital of new companies formed during July to engage in the shipping and shipbuilding business showed a sharp decline from the previous month. Records compiled by the *Journal of Commerce*, New York, show 18 companies having authorized capital of $26,250,000 were chartered in July against 33 firms with a capital of $86,050,000 formed in June. In July of last year, the similarly indicated investment was $42,485,000. Last month's total was the smallest of any month this year.

The total indicated investment in the first seven months of this year equals $494,653,000, a monthly average of $70,664,714. In the same period last year the total was only $140,836,000 and for the entire year of 1919, only $323,613,000. The 1920 figure, at the present rate, will exceed the total from the beginning of the war to the end of 1919.

The July record follows:

JULY, 1920

Blue Star Shipping Corp., Del.	$100,000
Baltimore Transatlantic Steamship Corp. Md.	250,000
Drew, William, Inc., Del. (build, own and operate boats)	200,000
Fulton Transportation Co., N. Y.	100,000
Franck Ship Chandlery Co., Inc., Md.	150,000
Gilmartin Steamship Corp.	250,000
Lee Bros. & Vidal, Inc., N. Y. (shipping and forwarding com. merchants)	1,050,000
National Inland Transport Line, Inc., Del.	300,000
Pacific Shipping Corp.	1,000,000
Seven Seas Maritime Corp., Del.	18,500,000
Slavia Shipping Corp., Inc., N. Y.	250,000
St. Johns Navigation Co., Inc., N. Y.	50,000
Tidewater Lines, Inc., Del.	500,000
United Bureau of America S.S. Owners, Inc., N. J.	50,000
U. S. Mex. Transports, Inc., Del.	3,000,000
Van Brunt Corp., Del. (build boats and operate)	200,000
Waterfront Service Co., Del.	200,000
Zephyr Navigation Co., Inc., Del.	100,000
Total	$26,250,000

The federal government is to pay $65,000 for the right of way for the Hansen canal in St. Mary Parish, La., according to the verdict of a jury of citizens of the parish, before Judge Rufus Foster of the United States district court at New Orleans. The canal belonged to the Albert Hansen Lumber Co. and the government wished to make it a navigable stream, but the two parties could not agree on the price, and a jury of prominent men of the parish was chosen to fix the figure.

The passenger steamer HAMONIC grounded north of Harbor Beach recently in a fog. No attempt was made to debark the passengers.

Digitized by Google

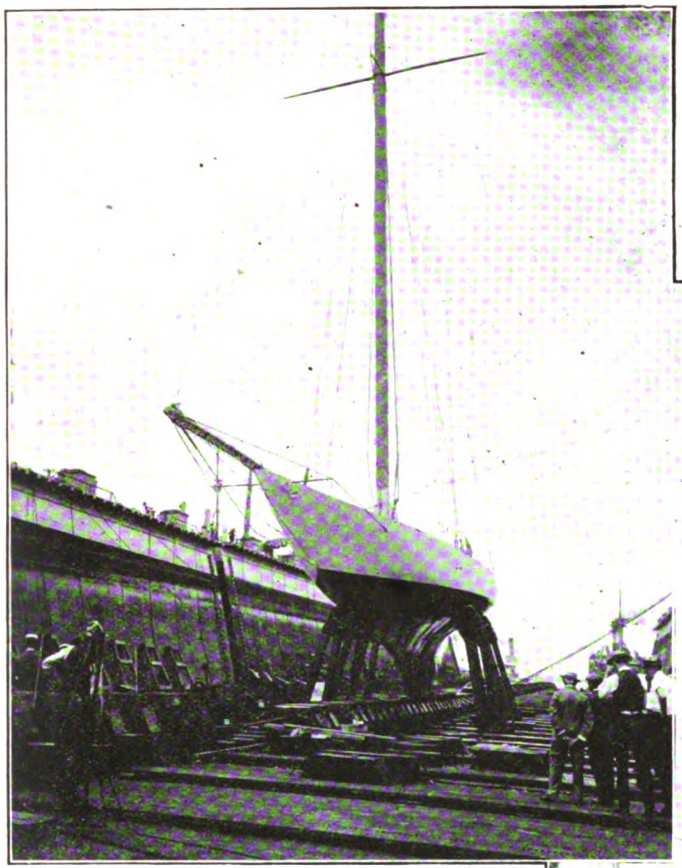
Late Flashes On Marine Disasters

Brief Summaries of Recent Maritime Casualties— A Record of Collisions, Wrecks, Fires and Losses

Name of vessel	Date	Nature	Place	Damage resulting
Antonio	July 14	Grounded	Queenstown	Not stated
Angelina	July 8	Disabled	Galveston	Not stated
Ancula	July 19	Grounded	River Tagus	Jettisoned cargo
Ansalmo 1	July 19	Grounded	Cape Fear	Not stated
Arambi	July 23	Disabled	Falmouth	Damaged valve
Anthera	July 28	Engine trouble	At sea	Not stated
Albert W. Robinson	July 22	Grounded	Alligator Reef	Not stated
American Eagle	July 24	Grounded	Grand Manan	Not stated
Ariosto	Aug. 3	Fire in bunker	At sea	Not serious
Banaran	July 16	Disabled	Falmouth	Mach. trouble
Barrington	July 20	Disabled	Boston	Lost blades
Broxton	July 29	Broke windlass	At sea	Not stated
Bottineau	Aug. 1	Short water	Charleston	None
Bitche	Aug. 3	Fire	Off Cape Tinoso	Sank
City of Berkeley	July 14	Disabled	At sea	Turbine stripped
Comus	July 12	Collision	Off Atlantic City	Not stated
Castletown	July 16	Disabled	Fayal	Boiler leaking
Consort	July 16	Disabled	Fayal	Boiler leaking
City of Pascagoula	July 17	Leaking	At sea	Cargo damaged
Charles E. Moody	June 28	Fire	Bristol Bay	Total loss
Cabrille	July 23	Grounded	Brigantine shoals	None
Caponka	July 22	Mach. trouble	At sea	Not stated
Coastwise	July 20	Foundered	Off Fire Island	Total loss
Canadian Recruit	July 18	Grounded	St. Anne shoals	Not stated
Centaurus	July 29	Collision	Genoa	Not stated
Calera	Aug. 2	Engine trouble	At sea	Not stated
Cottonwood	July 31	Collision	At sea	Waterlogged
Caroline	July 18	Fire	Antofagasta	Serious
C. S. Robinson	July 16	Grounded	Off West Neebish	Steerer broke
C. H. Bradley	July 18	Collision	Off Thunder Bay	Not serious
Carib	Aug. 4	Fire	New York	Slight
Calvert	Aug. 4	Grounded	Off Hog Island	Not stated
Caldan	Aug. 4	Collision	Off Philadelphia	Not stated
Dauperata	July 17	Disabled	Falmouth	Mach. trouble
Dahlia	July 17	Disabled	Barry	Boiler, mach. trouble
Deranof	Aug. 2	Disabled	Plymouth	Steerer trouble
Eagle	July 7	Collision	St. Johns	Lost headgear
Eastern Queen	July 25	Lost rudder	At sea	Not stated
Elkridge	July 4	Fire	At sea	Not stated
Elkwater	July 30	Lost blade	At sea	Not stated
Fucloil	July 20	Struck obstruction	Off Egmont bar	Stripped propeller
Falmouth	July 16	Leaking	At sea	Heavy
F. B. Squire	July 14	Grounded	Erie harbor	None
Frank B. Stevens	Aug. 4	Sprung leak	Ashtabula	Sank
Governor Brooks	July 25	Heavy weather	Off River Plate	Leaking
Glenlyon	July 13	Struck dock	Port Huron	None
Griffin	July 21	Grounded	Rock island	None
Harold Conrad	July 13	Collision	At sea	Not stated
Huron	July 23	Collision	San Domingo	Not stated
Hermea	July 16	Collision	Elbe river	Steerer trouble
Haddon Heights	Aug. 4	Collision	Off Philadelphia	Slight
Henry Steinbrenner	Aug. 6	Grounded	Sweets Point	Not stated
Italia	July 13	Grounded	Off Shooter island	Not stated
Isis	July 7	Collision	St. Johns	Not stated
Ingold	July 23	Disabled	Malta	Mach. trouble
Isanti	July 23	Disabled	New York	Dynamo, pump trouble
Isonomia	July 24	Boiler trouble	At sea	Not stated
Iroquois	July 28	Disabled	Charleston	Boiler trouble
Jules Henry	July 13	Disabled	Marseilles	Engine trouble
Jane Palmer	July 20	Leaking	Off Graves light	Not stated
Jacris Conde	July 22	Capsized	Mazatlan	Foundered
John Fritz	July 21	Collision	Off South Chicago	Broke hawse pipe, lost anchor
Kermoor	July 16	Collision	Hamburg	Damaged bow
K. I. Luckenbach	July 22	Disabled	Rotterdam	Engines disabled
Katherine Moran	July 25	Sank	North river	Total loss
Kanakea	July 28	Disabled	At sea	Short bunkers
Lake Elmwood	July 15	Struck bottom	Lachine canal	Damaged plates
Lady St. Johns	July 13	Collision	At sea	Damaged stem, bow sprit
Lake Frampton	July 12	Collision	Off Atlantic City	Sank
Lake Silver	July 19	Collision	Off Highland light	Heavy
Lackawanna Valley	July 23	Boilers disabled	At sea	Heavy
Lake Hewes	July 23	Collision	At sea	Bow stove in
La Touraine	July 21	Grounded	Wolf Bank	Slight
Lake Fontanet	July 31	Disabled	Falmouth	Engine trouble
Lake Elva	Aug. 5	Engine trouble	At sea	Not stated
Mildred	July 14	Grounded	Hunnewell point	Disabled
Moshula	July 15	Distress	Two-fold Bay	Not stated
Mobile	July 12	Disabled	Liverpool	Mach. trouble
Mabel E. Gunn	July 19	Collision	Off Highland light	Slight
Mopan	July 15	Steerer trouble	Mobile	Not stated
Malahat	July 24	Disabled	Sydney	Lost propeller
Martha P. Small	July 23	Lost rudder	Off Polinio	Not stated
Mary Woolson	July 18	Sank	Lake Huron	Total loss
Mahana	July 24	Lost blades	At sea	Not stated
Maindy House	July 26	Grounded	Ship island	None
M. S. Kenney	July 26	Grounded	Hospital reef	Total loss
Morocco	July 31	Leaking	At sea	Cargo damaged
Mahaska	Aug. 2	Disabled	Boston	Boiler trouble
Maplegrove	July 13	Struck pier	Port Dalhousie	Heavy
Mizter	July 18	Heavy weather	Off Thunder Bay	Abandoned
Munsoma	Aug. 3	Cargo afire	At sea	Not stated
M. J. Parks	July 28	Grounded	Crow Island Rock	Not stated
Nueces	July 14	Fire	New York	Slight
North Pole	July 14	Disabled	Gibraltar	Engine trouble
Norwhal	July 26	Heavy weather	Off Tortugas	Lost tow
New Rochelle	Aug. 4	Engine trouble	At sea	Not stated
Oasis	July 22	Grounded	Mad Moll reef	Not stated
Poldennis	July 14	Grounded	Dardanelles	Not stated
Panola	July 13	Disabled	Halifax	Pump, condenser trouble
Prosho	July 16	Distress	Off Vancouver island	Not stated
Pioneer	July 21	Fire	Off Boston	Slight
Pasadena	Aug. 2	Disabled	Callao	Not stated
Quinnesco	July 24	Fire	At sea	Heavy
Romeo	July 25	Disabled	Calcutta	Mach. trouble
Ryder Family	July 26	Disabled	San Francisco	Engine trouble
Rosalind	Aug. 5	Lost blade	At sea	Not stated
Singleton Palmer	July 20	Grounded	Gulfport	Sprang leak
Seypen	July 14	Heavy weather	At sea	Damaged rudder
Santa Elena	July 27	Fire	Valparaiso	Total loss
Salaverry	July 30	Grounded	James Point	Not stated
Santiago de Cuba	July 31	Fire	Santiago de Cuba	Total loss
Samuel Mather	July 18	Struck dock	Chicago	Damaged stern
Samuel F. B. Morse	July 31	Grounded	St. Clair Flats	Not stated
Strathlorne	Aug. 2	Fire	Bordeaux	Not serious
Suportco	Aug. 5	Leaking	Off Nova Scotia	Not stated
T. W. Scott	July 14	Pump disabled	Off Frying pan Shoals	Leaking
Tangarora	July 17	Disabled	Honolulu	Engine trouble
Unicol	July 29	Disabled	At sea	Boiler trouble
Virginia	July 11	Explosion	South Boston	Not serious
Viking	July 7	Collision	St. John's	Not stated
Ville de Metz	July 22	Grounded	Liverpool	None
Western Belle	July 15	Engine trouble	At sea	Not stated
Winthrop	July 16	Listed	Off Cape Henry	Capsized
West Hardaway	July 12	Damaged mach.	At sea	Not stated
Wabana	July 17	Struck obstruction	At sea	Damaged bow
Willdomino	July 24	Struck rock	Off Canso	Damaged bow
Wico	July 23	Grounded	Off Lisbon	Jettisoned cargo
W. M. Irish	July 23	Collision	At sea	Not stated
West Harts	July 26	Grounded	Off Shimonoseki	Bottom damaged
West Cohas	July 22	Disabled	At sea	Not stated
West Isleta	July 21	Pump trouble	At sea	Not stated
Western Ocean	July 20	Collision	Off North Point	Steerer disabled
William Siemens	July 21	Collision	Off South Chicago	Not stated
William P. Fitch	Aug. 4	Grounded	Moon Island	Not stated
Wheeling Mold	Aug. 6	Grounded	Moon Sound	Not stated
West Eldara	Aug. 6	Grounded	Off Barbers Point	Not serious
W. H. Wolf	Aug. 5	Grounded	Devils Island	Damaged forward
Yague	July 23	Collision	San Domingo	Damaged side
Youngstown	July 27	Leaking	Roads of Aarhuus	Not stated

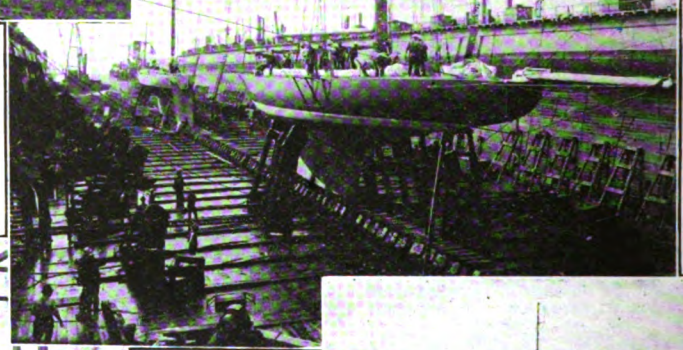
Digitized by Google

Photographs from Far and Near

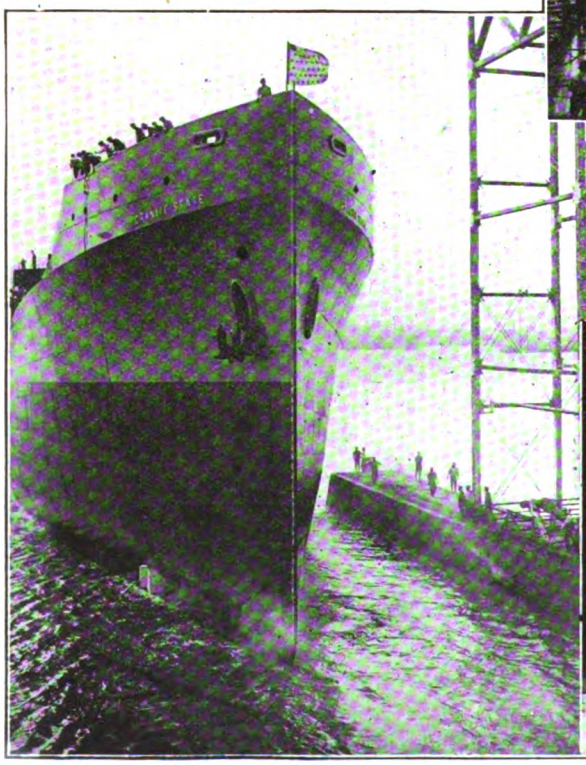


United States torpedo boat destroyer Lawrence taking the water at Camden

Resolute (upper) together with Shamrock IV in Morse Dry Dock & Repair Co.'s floating drydock at Brooklyn



Granite State, launched at Camden, and her sponsor, Miss Forsythe Patterson, daughter of Charles Patterson, of the legal department, Emergency Fleet Corp.

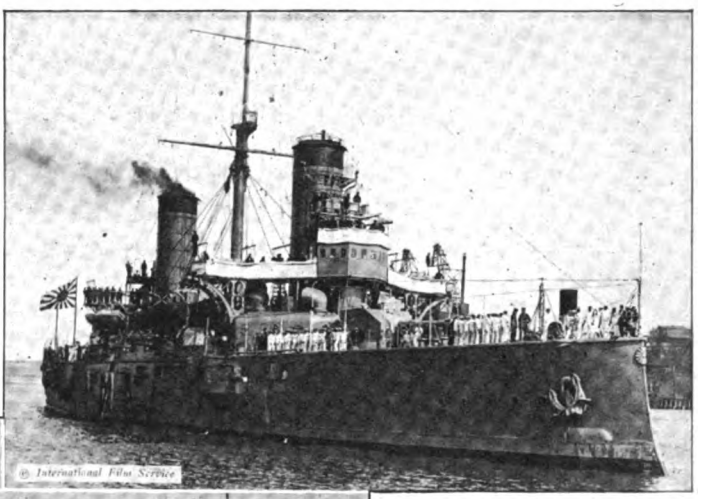


Deutschland, beached at Ramsgate, England, after crashing against pier. British are exhibiting her at 50 cents a head

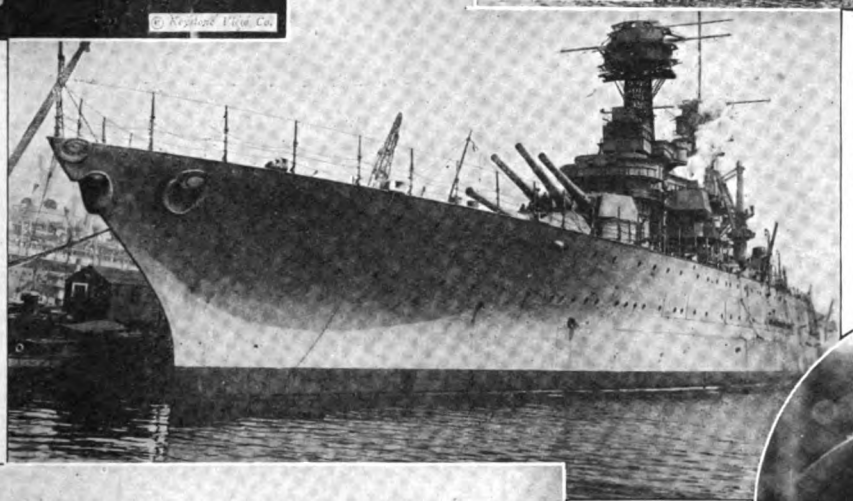
Digitized by Google

Latest Marine News in Pictures

Testing the new type of hydrophone on the destroyer Breckinridge, 35 miles out at sea. Left to right: Prof. Max Mason, submarine commission; Prof. G. N. Pierce, Harvard university, and Prof. H. C. Hayes

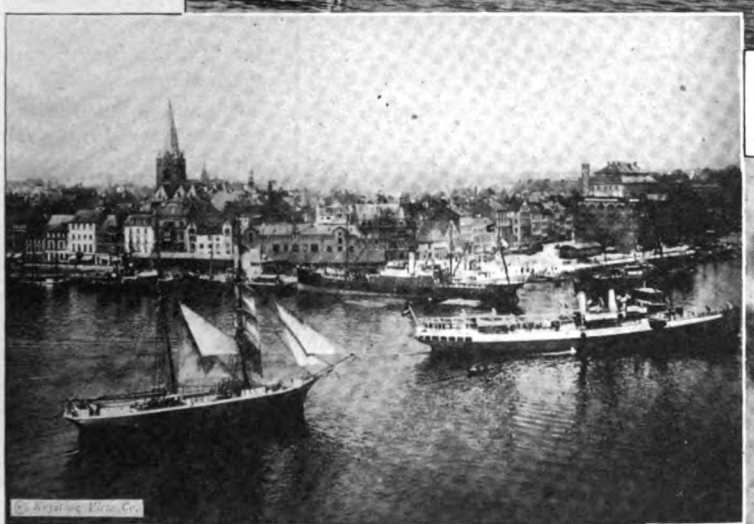


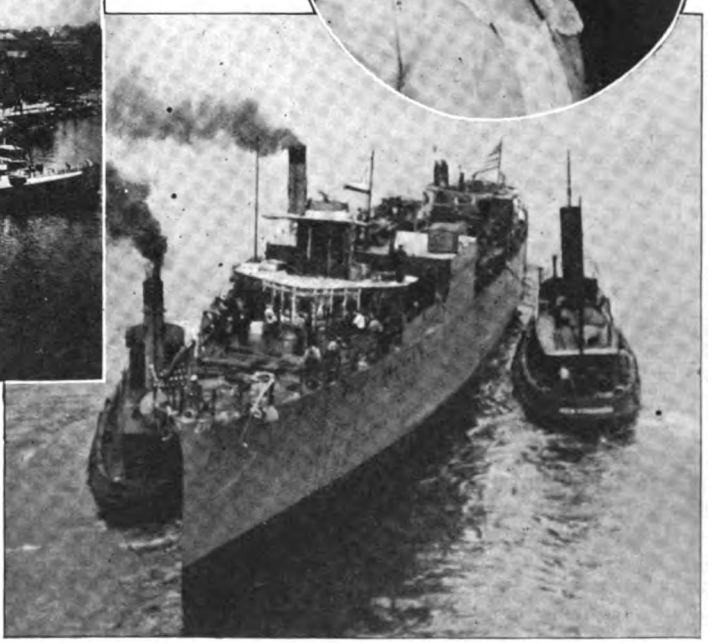
Kasuga, Jap warship, drops in for friendly call in the Hudson



An interesting glimpse of the harbor at Kiel, Germany

The electrically propelled battleship Tennessee is capable of making 21 knots. Her main engines consist of two Westinghouse turbine generators rated at 15,000 kilovolt amperes each





The United States torpedo boat destroyer Bainbridge, like the Lawrence, shown on the opposite page, was launched recently at the yards of the New York Shipbuilding Corp., Camden. Miss Juliet Edith Greene was sponsor for the Bainbridge

Digitized by Google

Practical Navigation Guide--V

Determining Compass Error by Amplitude—Use of North Star in Finding Ship's Position

BY V. G. IDEN

TO FIND the compass error by amplitude reckoning is even quicker than the method of working it out from azimuth. The compass bearing of the sun, for instance, when its center is in the true horizon is observed. True amplitude is the true bearing of a celestial body at the time of rising or setting. It is reckoned from the east at rising and toward the declinaion and from the west at setting and toward the declination.

To the local mean time is combined the longitude in time. Naturally, if the longitude of the ship is west the longitude in time is added to the local time, but is subtracted if the longitude of the ship is east. This gives the Greenwich mean time, and for the Greenwich mean time we can find the declination of the sun (or for such other celestial body as may be observed). In this manner we obtain the correct declination of the sun.

The secant of the latitude of the ship added to the sine of the declination of the observed body will give the logarithmic sine of the true amplitude. Bowditch in Table 39 gives a ready method of finding the amplitude, when the latitude and the declination are known, but for more accurate work this should be figured out by Bowditch Table 44 from which the logarithmic sine of the true amplitude is taken. The compass amplitude has already been observed and naturally the difference between this compass amplitude and the true amplitude will be the compass error. Navigators find it advisable to plot the true amplitude and the compass amplitude in order to give the proper designation of direction to the compass error. The rule, when the two angles are plotted, is that when the true amplitude is to the left the error is west, and when the true amplitude is to the right of the compass amplitude, the error is east. Fig. 13 illustrates plotting a compass error that is west. In this figure, the angle *WOC* is the compass amplitude and the angle *WOT* is the true amplitude. In this instance, the error is naturally west.

Having found the compass error, we next find the compass deviation in the same manner as it would be found when reckoning the correction by azimuth, by taking the compass variation into account.

Take the case of a ship which on Nov. 23, 1919, was in latitude 56 degrees 42 minutes North and longitude 49 degrees 45 minutes West. The local mean time was 4 hours and 3 minutes. The compass amplitude noted was West 20 degrees 30 minutes South. The variation of the compass was 41 degrees 20 minutes West. Table VIII shows how to find the deviation on the ship's heading.

Frequently it is desirable to work out a ship's position at night and in this case a navigator will normally take an observaton of Polaris, commonly known as the North Star. It is possible to work out position by observation of any of the other well known celestial bodies, but Polaris is most generally known and recognized. Furthermore, Polaris is the star toward which the north pole of the earth very nearly points and which accordingly seems fixed and immovable in the sky. It is distant from the pole about 1 degree, 8 minutes.

In such calculations, the navigator becomes involved in a varying reckoning of time, which is known as sidereal time. Sidereal time is measured by the apparent motion of the stars.

Sidereal time is time reckoned by sidereal days, or, taking the sidereal day as the unit, the time elapsed since a transit of the vernal equinox, reckoned in parts of a sidereal day. This is, strictly, apparent sidereal time, mean sidereal time being reckoned from the transit, not of the true, but to the mean, equinoctial point. Sidereal time has been calculated by the observatory experts and the results tabulated in the nautical almanac which is offered for sale to navigators by the government.

In working out position by observation of Polaris, it is first necessary to reduce the recorded time of the observation to the local sidereal time. This is done by adding to the Greenwich mean time of the observation the sidereal time, or right ascension of mean sun. This latter is given in the nautical almanac tables of computation for the sun on the date for which the observation is made. In Table III of the nautical almanac is given the number of minutes and seconds for the amount of elapsed time from Greenwich noon. These two sums added to the Greenwich mean time gives the Greenwich sidereal time. The nautical almanac also gives a table of the apparent places of the stars upon any date of the year. In the table for the upper transit, the right ascension of Polaris will be noted in hours, minutes and seconds. This time is subtracted from the Greenwich sidereal time

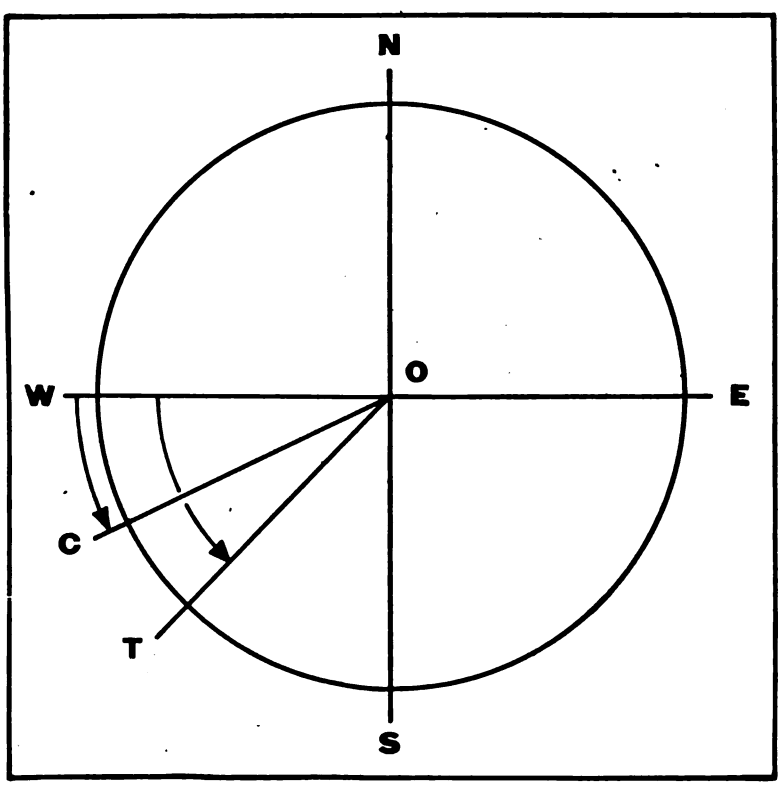


FIG. 13—PLOTTING A COMPASS ERROR

Digitized by Google

already found, and the remainder will be the hour angle at Greenwich. To this hour angle is applied the longitude of the ship reduced to time. If the longitude is west, it is subtracted and if it is east it is added. The remainder will be the hour angle of Polaris at the ship.

With this hour angle as a guide, the declination of Polaris is taken from the table giving the apparent places of the stars. Prior to this, of course, the observed altitude of Polaris has been reduced to true altitude. With the hour angle as the vertical argument, and the apparent declination of Polaris as the horizontal argument, the correction is taken from Table I of the nautical almanac and added to or subtracted from the true altitude, according to its sign. The result will be the latitude of the ship at the instant of observation.

Take the case of a ship which on Sept. 10, 1919, was in longitude 30 degrees 17 minutes west. The true altitude of Polaris was found to be 52 degrees 41 minutes 44 seconds out of meridian. The local mean time was 2 hours, 30 minutes and 13 seconds, a. m., but the time as corrected by chronometer was 4 hours, 31 minutes and 21 seconds, a. m. The latitude at the time of observation is determined as in Table IX.

(To be continued.)

Table VIII

Determining Compass Error By Amplitude

Local mean time		22d 4h 03m 00s
Longitude 49 deg. 45 min. W (Bowditch, Table 7) in time		3h 19m W (added)
Greenwich mean time		23d 7h 22m 00s
Declination on Nov. 23 was—		
	20d 11m 22s S	Hourly variation 32
Correction	3m 56s	x7.4
	20d 15m 28s S	236.8—3m 56s correction (increasing)

(Bowditch, Table 44)

Latitude	56d 42m 00s N	secant	0.26041
Declination	20d 15m 28s S	sine	9.53922
			9.79963 Logarithmic sine of True Amplitude which is 39d 05m.
True amplitude			W 39d 05m S
Compass amplitude			W 20d 30m S
Compass error			18d 35m W
Variation			41d 20m W
Deviation			22d 45m E

Table IX

Finding Latitude by North Star

Chronometer time	10d 4h 31m 21s	
Since it was a. m.	—1 +12	
Chronometer time of Greenwich mean time	9d 16h 31m 21s	
Right ascension	11h 09m 56s	
Translate to sidereal (Table III)	2m 42s	
Greenwich sidereal time	9d 27h 43m 59s	right ascension of Greenwich mean time
Right ascension of North Star	1h 32m 45s	
Hour angle at Greenwich	9d 26h 11m 14s	
Longitude 30d 17m W in time	2h 01m 08s W	
Hour angle at the ship	9d 24h 10m 06s	which equals 10d 00h 10m 06s

The declination of Polaris on Sept. 10, 1919, was 88 degrees, 52 minutes, 26 seconds.

With the hour angle as the vertical argument and the declination as the horizontal argument, the correction given in Table I is 67 minutes 27 seconds which equals 1 degree, 27 minutes, 27 seconds and the sign is minus.

True altitude of North Star	52d 41m 44s N
Correction	1d 07m 27s —
	51d 34m 12s N Latitude of the ship

What the British Are Doing

Short Surveys of Important Activities in Maritime Centers of Island Empire

ANOTHER wage dispute is raging in Scotland, with the Shipbuilding Employers' federation on one side and the Clyde shipwrights on the other. An interesting feature of this wrangle is that the men no longer base their claim for higher wages on the increase in the cost of living, but merely because the joiners have received an advance of 12 shillings, about $2.40, per week. The Shipbuilding Employers' federation has refused the claim of the shipwrights union, to which has been joined the blacksmiths and boilermakers, to 3 shillings (60 cents) per day advance, and the Clyde branches of the union have, therefore, called on their executive committee to declare a national strike in order to enforce the demand. The shipwrights, blacksmiths and boilermakers in the Clyde yards number about 30,000 men. The industrial court at Glasgow, Scotland, has also recently been concerned with the hearing of a number of other labor disputes in connection with the shipbuilding industry. In one case, the Amalgamated Union of Labour is asking the court to grant the men employed by Sir William Beardmore & Co. as boilershop laborers working in conjunction with piecework boilermakers a 12½ per cent bonus in lieu of the present 7½ per cent. In the Belfast shipbuilding and engineering trades, an advance of 6 pence per hour for men and 3 pence an hour for boys is being asked with corresponding advances on piecework rates. This demand covers two yards at Larne, Ireland, the firms of J. & E. Hall and the Sunderland Forge Co.; the Belfast Harbour Commissioners; Harland & Wolff, and Workman, Clarke & Co. The men also are still persevering in their demand for a 44-hour week. The North of Ireland Shipbuilding Co., Ltd., has reopened its yard at Londonderry, since the recent Sinn Fein disturbance has in some measure calmed down.

* * *

ON JULY 15, the shipping controller of Great Britain withdrew all government controlled rates of freight, coastal and otherwise. The British government is being severely criticized for discontinuing the coastwise shipping subsidy at the present time, the contention being that assistance to coastwise shipping should continue until normal competitive conditions of transport are resumed. Sir Norman Hill, in addressing the house of commons on this matter, argued that a genuinely fair economic traffic should be introduced on the railways, by the abolition of excep-

Digitized by Google

Sells 198 Government Ships At Cost Of $4250

WHILE the United States shipping board is still struggling through yards of official red tape, delay and confusion in its efforts to dispose of America's war-built merchant fleet comes the news that England has sold the last of her government-owned ships. When the war ended the British ministry of shipping, which corresponds to the shipping board, owned 198 merchant vessels. Various plans for selling out were suggested. Finally the whole proposition was turned over to Lord Inchcape, chairman of the Peninsular & Oriental Steam Navigation Co. The ships in question, through Sir Joseph Maclay, the shipping controller, were placed in the hands of Lord Inchcape *en bloc* and he made himself personally responsible to the government for the financial success of the transaction. The last ship has now been sold and the whole job completed in about a year. The fleet aggregated about 1,400,000 tons. Total return from sales was $175,000,000, about $900,000 per ship or an average of $125 per ton.

The cost to the British government, under Lord Inchcape's management, was only $4250—practically nothing. A more vivid contrast between the methods of the trained business man, working untrammeled along business lines, and the costly, blundering efforts of an official bureaucracy could scarcely be found.

In his great task, Lord Inchcape was assisted by Sir Owen Phillips and other patriotic British maritime leaders. None of the principals or their associated companies made any profit out of the transaction. The British government is now out of the shipping business and all of the merchant vessels under the British flag are in the hands of private owners. England believes that the methods of private initiative which have brought her to the top of the ladder in the struggle for maritime supremacy will suffice to meet the demands of postwar competition.

tional rates, before the coastwise subsidy is removed. Although these considerations appeal mainly to the British shipowners who have vessels in the coasting trade, there are wider aspects which affect the smooth and easy working of trade at the larger ports of Britain. The ocean going vessels in these ports depend to a great extent on smaller vessels for rapid discharge. Without this assistance, the warehouses and quays become congested and it was this very fact that induced the government last year to introduce the coastwise subsidy to attract the small vessels.

* * *

ON JULY 15, 115 ships of 663,000 tons were under construction in British yards for Norwegian account. The total value of these contracts in three consecutive years, including the current year, is estimated at £15,200,000 ($60,800,000). By a recent judgment in the arbitration court of Norway, it was decided that the iron, steel and shipbuilding industries should grant an increase in wages of 25 per cent and it is feared that this will necessitate the placing of orders for new bottoms in foreign countries. It is estimated that with this 25 per cent increase, vessels built in Norwegian shipyards would cost 300 crowns ($72) a ton more than if built in England.

Merger Unites Big American Fleets

THE American Ship & Commerce Corp. and the American-Hawaiian Steamship Co. have purchased Livermore, Dearborn & Co. to operate the joint fleets of the purchasers aggregating 400,000 deadweight tons besides about 200,000 tons of shipping board vessels. W. A. Harriman, in announcing the purchase stated also that the contract, by which the Kerr Steamship Co. has been operating the vessels of the Kerr Navigation Co., an American Ship & Commerce subsidiary, had been canceled and that the name of the Kerr Navigation Co. would be changed to the American Ship & Navigation Corp.

The name of Livermore, Dearborn & Co., will be changed to the United American line under which all ships of the fleets of the purchasing companies and their subsidiaries will be operated. Harris Livermore, senior operating officer of the Livermore-Dearborn firm and president of the Shawmut Steamship Co., becomes president of the new line and Henry Dearborn, previously senior vice president of the old firm, becomes vice president of the new line. Capt. E. C. Tobey and W. G. Sickel, formerly resident vice president in New York of the Hamburg-American lines, are associated with the new organization, while E. Lederer, formerly with the Hamburg-American firm, is connected with the passenger traffic lines. The United American line will carry out the agreement recently made with the big German firm by the Harriman interests.

The following list shows the vessels which will be operated by the United American line:

Kerr Navigation Corp. Fleet: KERESAN, KERLEW, KEROWLEE, KERKENNA, KERESASPA, KERMOOR, KERMIT, KERMANSHAH, MONTICELLO, MONTPELIER. Total, 10.

American-Hawaiian Fleet: ALASKAN, AMERICAN, ARIZONAN, DAKOTAN, FLORIDIAN, HAWAIIAN, IOWAN, KENTUCKIAN, MEXICAN, MINNESOTAN, OHIOAN, OREGONIAN, PANAMAN, PENNSYLVANIAN, TEXAN, VIRGINIAN, MISSOURIAN (now building), CALIFORNIAN (now building). Total to be 18.

Coastwise Transportation Fleet: CORSICA, FRANKLIN, HAMPDEN, MIDDLESEX, NORFOLK, SUFFOLK, PLYMOUTH, TRANSPORTATION, CLARKSBURG, a steamer. Total, 10.

Shawmut Fleet: MYSTIC, IPSWICH, SUDBURY, two building. Total to be 5.

American Ship & Commerce Corp.: DEKALB, ex-German passenger steamer. Total 1.

Livermore, Dearborn Fleet shipping board steamers. Total deadweight between 150,000 and 200,000.

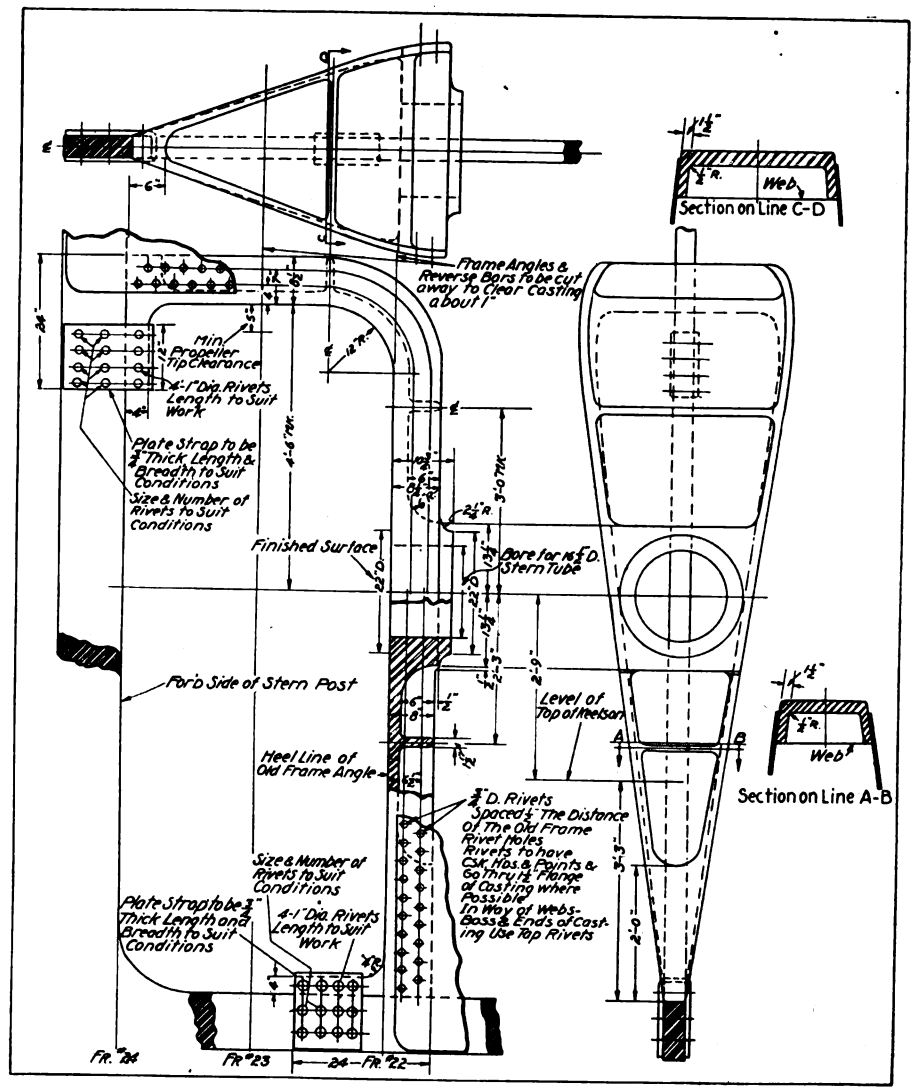
The grand total of steamers at present involved in the combination of lines is 86, and deadweight is nearly 600,000.

All the vessels of the Kerr Navigation Corp.'s fleet are ex-Austrians, purchased three years ago by consent of the shipping board, with the exception of the MONTPELIER and MONTICELLO, which are ex-German. The KERWOOD was lost several months ago while in the New York-Hamburg service.

Digitized by Google

Putting the Sailer on Schedule

Auxiliary Power Removes Operating Uncertainties—Methods of Installation Are Now Standardized


Section on Line C-D
Frame Angles & Reverse Bars to be cut away to clear Casting about 1"
Min. Propeller Tip Clearance
4-1" Dia. Rivets Length to Suit Work
Plate Strap to be 1" Thick, Length & Breadth to Suit Conditions
Size & Number of Rivets to Suit Conditions
Finished Surface
Bore for 14" D. Stern Tube
For'd Side of Stern Post
Level of Top of Keelson
Heel Line of Old Frame Angle
Section on Line A-B
1" D. Rivets Spaced 3" The Distance Of The Old Frame Rivet Holes Rivets to have Csk. Hds. & Points & Go Thru 1½ Flange of Casting where Possible In Way of Webs-Boss & Ends of Casting Use Top Rivets
Size & Number of Rivets to Suit Conditions
Plate Strap to be 1" Thick Length and Breadth to Suit Conditions
4-1" Dia. Rivets Length to Suit Work
Fr. "24"
Fr. "23"
24 — Fr. "22"

PROPELLER POST CASTING FOR AUXILIARY SCHOONER

EXPERIMENTS in designing economical ships have directed the attention of efficiency engineers to the auxiliary sailing craft and today many such vessels are appearing on the seas reminding old seamen of the days when steam navigation was in its infancy and when mechanical power for propulsion was considered too uncertain to depend upon exclusively. In those days, the sails were fitted to a ship to assist the engines. Today the engine is being fitted in sailing vessels to assist the sails. Old canvas flappers came into their own during the war as a result of the ship shortage. They have remained profitable since the armistice due to the tremendous demand for cargo space. But the great drawback to a sailing vessel is that it cannot guarantee the time of delivery of its cargo.

American sailers are concentrated in the coastwise trade. These vessels are rarely becalmed. But ships which are sent into long runs across the ocean are compelled to take greater chances. It has been estimated that a sailer on a three months' trip will be becalmed approximately 10 per cent of the time. A doldrum is expensive and it is for the purpose of enabling such ships to escape from a period of enforced inactivity that auxiliary mechanical propulsion is employed. A great many such installations have been made during the past year, and now a number of new American sailers are being built with auxiliary power drafted into their original design.

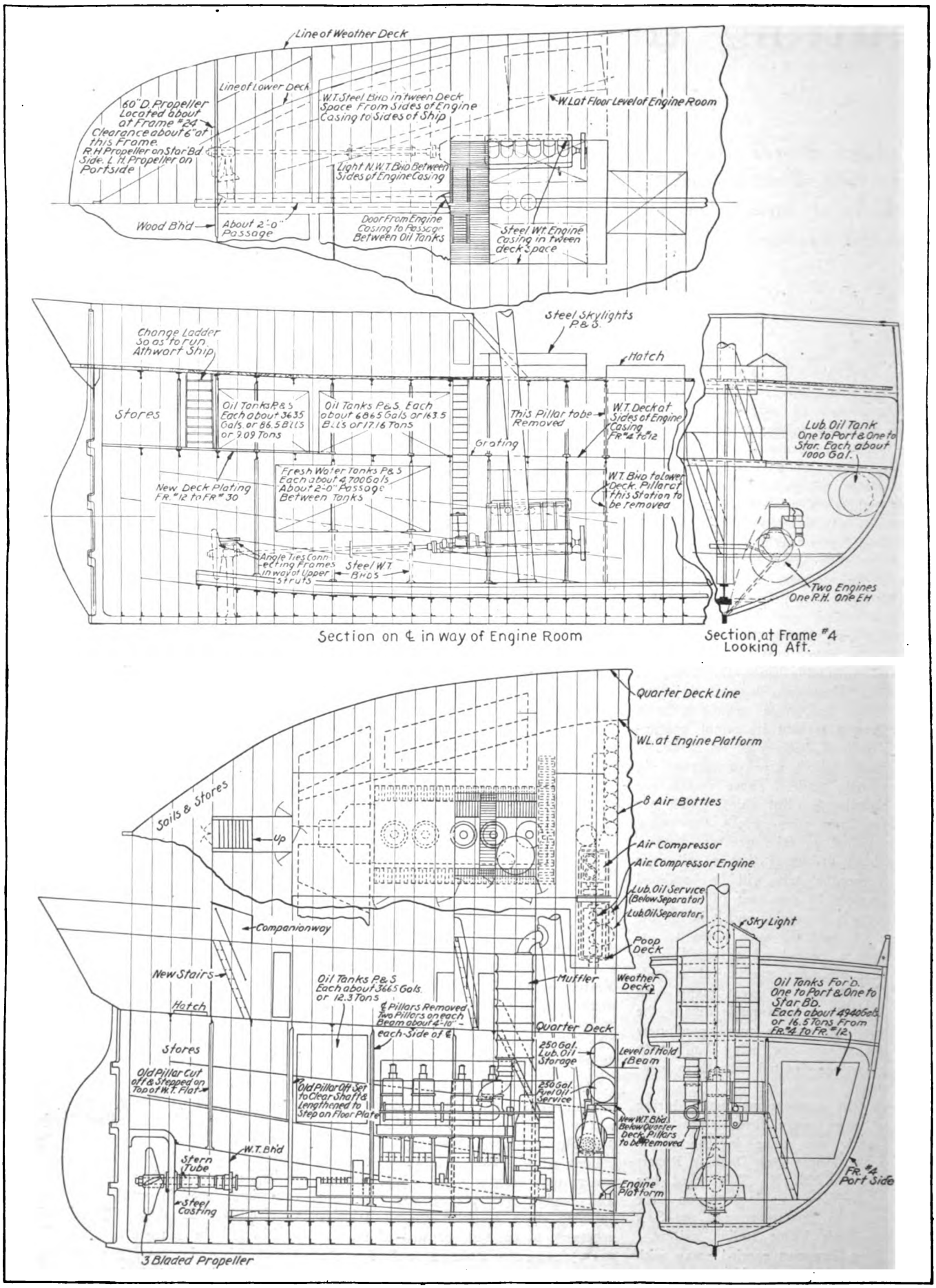
Among the conversions made during the past year, were three ships upon which work was done in the repair yard of the Morse Dry Dock & Repair Co., Brooklyn, N. Y. This yard has placed auxiliary engines upon the schooners DEL BOSCHETTO and the SAN GUISEPPE, both being Italian sailers.

The SAN GUISEPPE carried away with her from the port of New York an auxiliary power plant consisting of a diesel engine capable of driving her 8½ knots and a fuel capacity for 15 days' continuous operation. The engine installed in this ship is a Southwark-Harris, built in Philadelphia and is of the 2-cycle reversible type, with a brake horsepower of 385 and an indicated horsepower of 625. The auxiliary engine used to drive the air compressor is of the semidiesel marine type. The bilge pump is driven by a Novo diesel engine, single cylinder.

The SAN GUISEPPE, being an old sailer, naturally has but a single bottom, so it was necessary to install tanks for the oil. She has now a capacity for 10,000 gallons of oil, and in addition a fresh water tank capacity of 3500 gallons. The engine was placed well aft and operates upon a short shaft. It was necessary to cut out forward of the old stern frame to make a well for the propeller. She has but one screw, the wheel being solid bronze, three bladed, 92 inches in diameter with a 37-inch pitch. The propeller has a projected area of 55 square feet and weighs 2300 pounds.

In making an installation such as this the after hatch is utilized. The engine and equipment is lowered through this hatch, and the trunk in that hatch is cased up. Usually a bulkhead is already in the vessel, but, if not, a wood bulkhead can be built in. By this method but little of the cargo space of the vessel is taken up. Under any conditions a sailer must always carry more or less ballast, and frequently the engine serves as a ballast. Installations such as these can normally be made within a month, but if all conditions are favorable it may not require over 15 days. By giving the architects the measurements of the vessel when in port, the engine may be designed, ordered, built and delivered to the repair yard by the time she returns from the trip. That ar-

Digitized by Google


Line of Weather Deck
Line of Lower Deck
60" D. Propeller Located about at Frame #24 Clearance about 6" at this Frame. R.H. Propeller on Star'Bd Side. L.H. Propeller on Portside
W.T. Steel Bhd in tween Deck Space From Sides of Engine Casing to Sides of Ship
W.L at Floor Level of Engine Room
Light N.W.T. Bhd Between Sides of Engine Casing
Wood B'hd
About 2'-0" Passage
Door From Engine Casing to Passage Between Oil Tanks
Steel Wt. Engine Casing in tween deck Space
Steel Skylights P&S.
Change Ladder So as to run Athwart Ship
Hatch
Stores
Oil Tanks P&S Each about 3635 Gals. or 86.5 Bills or 9.09 Tons
Oil Tanks P&S. Each about 6865 Gals or 163.5 Bills or 17.16 Tons
This Pillar to be Removed
W.T. Deck at Sides of Engine Casing Fr #4 to #12
Grating
Lub Oil Tank One to Port & One to Star. Each about 1000 Gal.
New Deck Plating Fr. #12 to Fr #30
Fresh Water Tanks P&S Each about 6700 Gals About 2'-0" Passage Between Tanks
W.T. Bhd to lower Deck. Pillar at this Station to be removed
Angle Ties Connecting Frames in way of Upper Struts
Steel W.T. Bhds
Two Engines One R.H. One E.H
Section on ℄ in way of Engine Room
Section at Frame #4 Looking Aft.
Quarter Deck Line
WL. at Engine Platform
8 Air Bottles
Soils & Stores
Up
Air Compressor
Air Compressor Engine
Lub. Oil Service (Below Separator)
Lub. Oil Separator
Sky Light
Companionway
Poop Deck
New Stairs
Oil Tanks P&S Each about 3665 Gals. or 12.3 Tons
Muffler
Weather Deck
Oil Tanks For'd. One to Port & One to Star Bd. Each about 49406 Gals or 16.5 Tons From Fr. #4 to Fr. #12
Hatch
℄ Pillars Removed Two Pillars on each Beam about 4'-10" each Side of ℄
Quarter Deck
Stores
250 Gal. Lub. Oil Storage
Level of Hold Beam
Old Pillar Cut off & Stepped on Top of W.T. Flat
Old Pillar Off Set to Clear Shaft & Lengthened to Step on Floor Plate
250 Gal. Fuel Oil Service
New W.T. Bhd Below Quarter Deck. Pillars to be Removed
W.T. Bhd
Stern Tube
Engine Platform
Fr. #4 Port Side
Steel Casting
3 Bladed Propeller

ENGINE ROOM ARRANGEMENT FOR SINGLE AND TWIN SCREW INSTALLATIONS

Digitized by Google

rangement naturally expedites the work.

The work done on the DEL BOSCHETTO was somewhat different inasmuch as twin screws were fitted in her. These Italian sailers are all small ships, measuring approximately 2000 tons and less. But the engines on the DEL BOSCHETTO, also Southwark-Harris, were smaller than the engine on the SAN GUISEPPE, the two together being able to drive her 8½ knots.

Some of the advantages mentioned for the auxiliary schooner are (1) the ship saves towboat fees by being able to enter port under her own power; (2) on a deep sea voyage she will be able to make her own way out of doldrums; and (3) when meeting head winds the engines will give steerageway. In other words the auxiliary engine takes the uncertainty out of sailing, and enables a schooner to maintain a schedule. And, inasmuch as she has an engine aboard, the vessel can be equipped with electric lights, which is no small advantage.

The crew of the sailer is not materially increased by reason of the engine. A sailer usually carries an engineer to work her donkey engines. This man is replaced with an engineer who understands the handling of diesel engines, and an assistant is drafted from the sailors in the crew. It is not infrequently the case that the engineer is put on in place of one other man in the crew. Such an arrangement is possible inasmuch as it is not the practice of auxiliary schooners to use both sails and engines at the same time.

Some sailing vessels have carried this development to its greatest extent and been converted from sailers to motorships.

A case of this nature was the American motorship KATHERINE, which was formerly the 4-mast British barkentine, COUNTY OF LINLITHGOW. She was built by the Barclay-Currie Co., Glasgow, Scotland. It was decided that the motor equipment aboard was entirely adequate for purposes of navigation, so she was dismantled of her masts and turned out as a motorship. The KATHERINE has three semidiesel engines.

On a 37-day trip from San Francisco to Manila all engines worked incessantly, save the port engine, which stopped for a period of 10 minutes. The motor drives were as reliable on a 63-day trip from Manila to London, stopping only once, that being during a 4-days' layover at Port Said and the Suez canal.

The main power plant of the KATHERINE, consisting of two 320-brake horsepower fuel oil engines of the Bolinder type, is fitted with air injectors and a special oiling system, which contains an arrangement for saving and filtering waste lubricating oil. The auxiliary machinery includes one 25-brake horsepower, stationary type, fuel oil engine running at 375 revolutions per minute and directly coupled to a 15-kilowatt generator and on the opposite end of the shaft through a clutch coupling to a 2-stage air compressor, which is used for supplying air to the main engines in case of accident to the main compressor. A 15-brake horsepower engine running at 450 revolutions per minute is directly connected to a 10-kilowatt generator, while a third, an 8-horsepower engine running at 550 revolutions per minute, is connected to a 5-kilowatt generator. All generators operate at 110-125 volts. An electric steering gearing is fitted.

The main bilge and circulating pumps are driven from the forward end of the crankshaft of each engine. Auxiliary pumping machinery consists of one, 4 x 6-inch, triplex, electrically driven pump with suctions to the sea as well as to the bilge; one electrically driven, 6 x 8-inch, triplex pump for fire and bilge service, as well as for emptying and filling cofferdams, directly connected to a 20-horsepower motor; one 3 x 4-inch, electrically driven, sanitary pump directly connected to a 3-horsepower motor.

The KATHERINE, operating under the American flag, is engaged in carrying cocoanut oil to the United States and Europe and general cargoes to Manila. She is 287 feet long.

Launch Big Freighters At Tacoma

TWO of the 7500-ton steel carriers, built for owners' account, have been launched by the Todd Drydock & Construction Co., Tacoma, Wash. The RED HOOK took the water on June 30 and the HOBOKEN on July 22. The RED HOOK was named in honor of the site of the Erie Basin plant of the Robins Dry Dock & Repair Co., a Todd corporation, while the HOBOKEN is commemorative of the Tietjen & Lang plant, also a unit of the Todd interests. The HOBOKEN was christened by Miss Florence Babish, whose father, Thomas Babish, is a veteran member of the Tietjen & Lang staff. A party from the Hoboken plant came out to witness the ceremony.

Work at the Todd Dry Docks, Seattle, is proceeding actively, many large repair jobs being handled there. This plant recently increased its force from 600 to 1000 men. The steamship EASTERN IMPORTER was changed from a coal to an oil burner and also had considerable other work done.

The Swedish steamer INDUS, built by the Coughlin yards, Vancouver, B. C., has been completed and delivered. On her trials this vessel developed 13.585 knots. The vessel was on trial 90 days after the keel was laid down, establishing a British Columbia speed record. This is the sixteenth steel vessel turned out by this firm.

Judgment has been signed at Vancouver, B. C., for $1,343,015 in favor of the Llyall Shipbuilding Co., against Raymond Van Hemelryck, agent of the Belgian government. The sum was for six 5-mast schooners, purchase of which was cancelled before delivery.

Contract for altering, repairing, overhauling and converting the Japanese-built shipping board steamer EASTERN EXPORTER from a coal to an oil burner was awarded to J. F. Duthie & Co. on a bid of $101,996 in 18 days. The same yard is installing new engines in the shipping board vessel WESTBORO.

Suit has been brought against the Seattle-North Pacific Shipbuilding Co. asking for a receiver on the ground that the directors are seeking to reduce the capital stock to escape payment of certain claims. The suit is brought by F. C. Le Doux and F. X. Le Doux who claim to have a judgment unpaid of $22,000. Smith & Paschall, brokers, have entered suit against the company for $420,000 alleged to be past due for commissions.

Keels for two of the 12,000-ton tankers to be built for the Swiftsure Oil Co. have already been laid at Portland, Oreg., by the Northwest Bridge & Iron works. Work will be well under way in August. At Vancouver, Wash., the G. M. Standifer Construction Co. is completing five steel steamers for the Green Star line and also has three contracts for 12,000-ton tankers for the Standard Oil Co.

Two of the four 9600-on steel freighters built by the Skinner & Eddy Corp., Seattle, have been sold. These are the ROBIN HOOD and the ROBIN ADAIR now on the Atlantic. The ROBIN GOODFELLOW, of the same fleet, is chartered to load coal in British Columbia for Rio de Janeiro.

Work of dismantling the plant of the Skinner & Eddy Corp. is well under way, a full cargo of equipment having recently been taken to San Francisco by the steam schooner ROSALIE MAHONY.

Capt. Charles Meynier, 81 years old, Mississippi river pilot for 50 years prior to his retirement, was killed by a street car in New Orleans late in July.

Digitized by Google

Marine News in a Personal Way

Intimate Gossip About What Leaders in the Maritime World Are Doing

CAPT. C. T. LARSEN, a well-known mariner, has been appointed port captain at Seattle for the Universal Shipping & Trading Co., which is operating five wooden steamers for the National Oil Co. Captain Larsen recently returned from a voyage around the world in the Seattle-built wooden motorship CHALLAMBRA.

* * *

GEORGE J. MCCARTHY, passenger agent in the Orient for the Pacific Steamship Co., has been advanced to the position of assistant general passenger agent with headquarters at Shanghai, China. Mr. McCarthy is making preparations for inaugurating passenger service between Seattle and the Orient by his company.

* * *

C. D. KENNEDY, district agent for the division of operations of the shipping board at Portland, Oreg., has resigned to take the position of Portland agent for Norton, Lilly & Co.

* * *

DUDLEY W. BURCHARD, a widely known and experienced shipping man who has been in charge of the division of operations, Seattle division, of the shipping board, has assumed his enlarged duties as head of the new shipping board division with headquarters in Seattle. Puget sound and Portland, Oreg., have been divorced from the San Francisco district under the jurisdiction of Mr. Burchard. This change has long been urged by local shipping interests.

* * *

A. C. STUBBE, until recently manager of the Columbia Pacific Shipping Co., has joined the Oregon & Ocean Corp., Portland, Oreg. Capt. W. Z. Haskins is vice president and manager of the new company which will engage in a general stevedoring, chartering and brokerage business on the Columbia river.

* * *

H. FRANKLIN SHEELY, for several years connected with Furness, Withy & Co., Baltimore, has been appointed Baltimore agent of the International Maritime Corp., New York. Mr. Sheely is a graduate of Baltimore City college, Maryland institute, and completed a course in merchant marine administration and operation at Johns Hopkins university. He served in the engineering department of the Sparrows Point, Md., plant of the Bethlehem Shipbuilding Corp. for a few months and subsequently joined the Baltimore Dry Docks & Shipbuilding Co. as draftsman.

* * *

LEE ROMNEY has been appointed Pacific sales manager, with headquarters at San Francisco, of the Oxweld Acetylene Co., New York. R. G. NOBLE is in charge of the recently reorganized export department of the Oxweld company, which is now located in the Carbide and Carbon building, New York.

* * *

DELOS W. COOKE, associate director of the Cunard line, has been made a cavalier of the order of Maurizio e Lassaro by the Italian government in recognition of the services he rendered to Italy during the war.

* * *

OTTO WEBER and A. WALDIKE are affiliated with Duncan & Duncan, New York, having been connected with the firm of Duncan, Jackson & Duncan before its reorganization as the former company.

* * *

CAPT. INSLEE T. WEST has been placed in charge of the branch office opened in Norfolk, Va., by the Quaker City Steamship Co. Captain West has recently returned from France where he served for two years as assistant general superintendent of the army transport service at Saint Nazaire and Brest. Previous to entering the army service, he was engaged in steamship work in the south for about 20 years.

* * *

F. B. COLE has been appointed assistant district manager in charge of construction for the North Atlantic district of the Emergency Fleet corporation. His headquarters will be at 45 Broadway, New York.

* * *

P. L. RHODES is the New York representative for the Union Shipbuilding Co., Baltimore. His offices are at 50 Church street.

* * *

F. J. COUSE, foreign freight agent of the Baltimore & Ohio railroad, recently resigned to become associated with Wilbur F. Spice & Co., ship agents, brokers and stevedores, New York. Mr. Couse had been connected with the Baltimore & Ohio railroad for 19 years, beginning as a messenger on one of their New York piers. He won rapid promotion, serving in every branch of the traffic department until 1912, when he was appointed assistant foreign freight agent at New York. In 1914, he became foreign freight agent at Baltimore. During the war, Mr. Couse was appointed a member of the freight traffic committee which controlled the movement of all export traffic through the North Atlantic ports.

* * *

JOHN BLOOMER, traffic manager for the Rolph Mail Steamship Co., San Francisco, has been appointed to a similar position with Hind, Rolph & Co., general agents at the western port for the steamship company.

* * *

ROBERT A. GRAHAM has resigned from the passenger department of the Cunard line to assume similar duties with the United States Mail Steamship Co., New York.

* * *

H. F. RUGER, formerly commercial agent of the Columbia Pacific Shipping Co. has joined the Portland, Oreg. office of Norton, Lilly & Co. in the same capacity.

* * *

W. B. KEENE, who has been district director for the gulf district of the United States shipping board since last January, has become assistant director of operations in the general office at Washington. He was previously connected with this office until he was placed in charge of the tug and barge department in New York. JOHN QUINN, district director at Boston, succeeds Mr. Keene in the gulf district and P. H. LACEY, of the operating department, Washington, takes Mr. Quinn's place in Boston.

* * *

GEORGE L. GUTHRIE, American Express Co., has been transferred to London, where he will have charge of the steamship business of the company arising from points north of Antwerp. Before joining the Express company he was in the employ of the France & Canada Steamship Corp., New York.

Digitized by Google

Marine News in a Personal Way

Intimate Gossip About What Leaders in the Maritime World Are Doing

J. B. KENNEDY has been appointed general passenger agent of the United States Mail Steamship Co., New York. He has been identified both in this country and in Europe for the past 20 years with the Cunard line and is one of the best known passenger men in the steamship business.

* * *

JAMES E. SCOTT has been appointed commercial freight agent for the United Fruit Co., at New Orleans.

* * *

A. K. ARMSTRONG, for some time associated with the government's forest service and the Forest Products Laboratory and previously in charge of wood ship construction as assistant to the chief surveyor of the American Bureau of Shipping, a specialist on the treatment and handling of wood and its products, has opened an office as timber engineer at 30 Church street, New York.

* * *

BRIG. GEN. FRANK T. HINES, formerly chief of the inland waterways and head of the army transport service, has resigned his command to become vice president and director of operations for the Baltic Steamship Co., New York. He will have sole charge of the company's fleet.

* * *

DELMAR G. Ross who recently resigned as engineer of Hare's Motors, Inc., Bridgeport, Conn., is now associated with Gaston, Williams & Wigmore, Inc., New York.

* * *

HARRY B. SKILLMAN, who conducts the page "Late Decisions in Maritime Law" in the MARINE REVIEW, is the editor of a new edition of internal revenue laws which has just been issued by the treasury department. The volume, which comprises 1035 pages, contains the income, excess profits, capital stock, estate, transportation and other internal tax laws now in force, and is annotated and indexed. Mr. Skillman has been connected with the bureau of internal revenue for the past two and a half years as a special attorney in the office of the solicitor.

* * *

CHARLES STEWART, manager of the Cunard Steamship Co., Boston, and Harry L. Porter, manager Furness, Withy & Co., Boston, were elected honorary members at the recent meeting of the Boston Marine society. Capt. Fred T. Tabeling of the steamer SABOTAWAN, Capt. Forrest C. Small of the steamer LAKE YEMASSE and Capt. Charles T. Show of the steamer NORTH LAND were elected members of the organization.

* * *

JOSEPH S. STULL JR., formerly general superintendent, Puscy & Jones Co., Gloucester, N. J., has been appointed assistant manager of ship construction, shipyards, and drydocks of the United States shipping board.

J. B. KENNEDY

* * *

H. F. DORGELOH, formerly with Christoffer Hannevig, Inc., and the French-American line, New York, is now cargo agent of the Bulk Freight Steamship Co., Hoboken, N. J.

* * *

F. R. WADLEIGH was recently appointed export sales manager of Weston, Dodson & Co., Inc., New York.

* * *

BAYLY HIPKINS has resigned as vice president and Pacific coast manager of the Foundation Co., New York. His future plans are not announced. As coast manager for the Foundation company, Mr. Hipkins had charge of all its general contracting work, shipbuilding, and other activities in the west.

* * *

R. H. COOPER, formerly assistant to the district director of the division of operations of the shipping board, San Francisco, has been appointed vice president of the Export Transportation Co., which recently reorganized. He succeeds Robert Ramsay. W. F. TAYLOR formerly assistant director at Washington is president.

* * *

CARL PUSTAU recently resigned from the Triangle Steamship Corp. and has joined the Susquehanna Steamship Co., owned by J. & F. Auditore & Co., New York.

* * *

COL. GEORGE VAN ORDEN has recently assumed command of the marine corps at the Charlestown navy yard, Charlestown, Mass., to succeed Col. Melville J. Shaw.

* * *

LIEUT. COM. WILLIAM L. DEYO has recently been appointed aide to Rear Admiral Samuel B. Robison, commandant of the Charlestown navy yard, Charlestown, Mass. He was formerly in command of the destroyer MORRIS.

* * *

FREDERICK T. D. COOK of the International Mercantile Marine passenger department at Boston has been appointed southern passenger manager of the company with headquarters at New Orleans, to succeed E. E. Provost who has retired. Mr. Cook has been affiliated with the Boston office for the past 21 years.

* * *

GEORGE DENCKER, formerly with the freight department of the Federal line, is now traffic manager of the French-American line, New York.

* * *

E. V. VACHON has been appointed general manager of the Pacific Union, recently organized at Portland, Oreg., to engage in a general import and export business.

* * *

DAVID C. YOUNG has been placed at the head of the recently established Seattle branch office of the firm of Martin & Gardner, New York. Mr. Young was formerly general manager of the Hanlon Drydock & Construction Co., San Francisco and Oakland, Cal.

Digitized by Google

Bits From the Log of Progress

Events of Interest to Those Engaged in Operating, Constructing and Outfitting Yards and Ships

THE importance of establishing a coaling station midway between the United States and the Orient, to be used by the commercial and naval ships of the United States, was pointed out by John Barton Payne, secretary of the interior, upon his return to Seattle from a tour of Alaskan waters recently. The coal would be supplied from the high-grade Matanuska, Alaska, field. Under such a plan, each 8800-ton ship enroute to the Orient would be able to add more than 1000 tons to its cargo-carrying capacity. At this time the increase in the earnings of each ship would approximate $40,000 a round trip or about $200,000 a year on a schedule of five round trips. This profit would write off the initial cost of a ship of this type in 10 years.

* * *

PLANS FOR THE conversion of 40 wooden hulls, now lying in Lake Union, Seattle, into oil storage tanks at a maximum cost of $40,000 each have been placed before the shipping board. An acute shortage of oil storage facilities in the Far East and other parts of the world brought about the suggestion.

* * *

PRELIMINARY investigation with reference to the proposed improvements of the Siskiwit river, Wisconsin, has been started by Lieut. Col. F. A. Pope, United States engineer office, Duluth. He has sent requests for specific information to all interested parties, with a view to making a report on the project based on their opinions.

* * *

THE UNITED STATES Mail Steamship Co. has leased a portion of the main floor of the building at 45 Broadway, New York, from the Emergency Fleet corporation for a period of one year, dating from July 19, 1920, where it will conduct a passenger and freight steamship business. The building was originally used by the Hamburg-American line for this purpose. The steamship company has made a 5-year charter contract with the shipping board for the ships GEORGE WASHINGTON, POCAHONTAS, MOUNT VERNON, CALLAO, SUSQUEHANNA, PRESIDENT GRANT, AMERICA, PRINCESS MATOIKA, AGAMEMNON, ANTIGONE, AMPHION, FREEDOM and MADAWASKA. Service has been inaugurated over the following routes: New York-Queenstown-Cherbourg-Bremen, returning via Cherbourg-Southampton; New York-Dover-Boulogne-Danzig; Boston-Queenstown-Cherbourg - Bremen, returning via Southampton-Cherbourg.

* * *

THE CHAPPAQUA, the last of the 25 standard 7500-ton steel cargo vessels built by the Standard Shipbuilding Corp. at its Shooters island yard, New York, for the United States shipping board, has been delivered. The Standard corporation is now building four 8400-ton tankers for the Eagle Oil Transport Co., London.

* * *

PRODUCTION OF Dutch shipbuilding yards during 1919 amounted to 183 ships, 182 built of steel and one of reinforced concrete. Of these, 92 were freight steamers, averaging from 400 to 10,000 tons each; 23 were ocean-sailing ships; two were seagoing motor cargo vessels, 14 were steam seagoing tugboats; 12 were fishing boats; 39 were inland navigation vessels, and one was a mail boat.

* * *

THE BOSTON Engineering Co., Boston, has been incorporated under the name of the Boston Engineering Co., Inc. The company was founded 19 years ago by the late Alexander F. Bremner to do marine repair work. During the war many of the ex-German ships were overhauled and repaired at its plant, foremost on the list being the AMERIKA, the largest ship ever entering Boston harbor. The officers of the company are as follows: Charles L. Service, president and general manager; Campbell T. M. Perley, vice president and general superintedent; G. P. Bremner, treasurer; E. G. Innis, assistant treasurer; Starr Parsons, attorney.

* * *

AS THE NEWLY authorized official classification agent for government ships, the American bureau of shipping has started to make surveys of the total merchant marine. These surveys are being carried out without interfering with the operations of the ships. The bureau now has surveyors in all American ports and plans to place surveyors of United States citizenship in all foreign ports where American vessels touch. Already the bureau has established its surveyors at Hamburg, Germany; Rio de Janeiro, Brazil, and Havana, Cuba. A fourth surveyor is shortly to be sent to San Juan, Porto Rico.

* * *

THE STEAMER APUS, the last of the five 9500-ton steel vessels built by the G. M. Standifer Construction Corp. yard, Vancouver, Wash., for the Green Star line, was launched on July 16.

* * *

THE NORTHWEST Bridge & Iron Co., Portland, Oreg., recently laid the keel of the first of the seven 12,000-ton tankers on its construction program and will lay the second keel within a few weeks.

* * *

CONTRACTS HAVE BEEN awarded to the Sparrows Point, Md., yard of the Bethlehem Shipbuilding Corp. for two foreign oil tankers. The ships will have the following dimensions: Length over all, 427 feet; beam, 53 feet; depth of hold, 31 feet; deadweight tonnage, 8400 tons. Their speed will be approximately 11 nautical miles per hour.

* * *

THE WEST NORRANUS sailed recently from Port Ludlow, Wash., with 2,000,000 feet of lumber for Buenos Aires, Argentina. She is the second carrier in the shipping board's new service from Seattle and other west coast ports to the River Plate, South America. This ship, together with two others, the ROTARIAN and the WEST NOTUS, has been added to the service because of the heavy volume of business coming over the route.

* * *

THE EXPORT department of the Oxweld Acetylene Co. has been removed from the company's factory, Newark, N. J., to the Carbide and Carbon building, 30 East Forty-Second street, New York. The department has been reorganized and is in charge of R. G. Noble.

* * *

A NOVEL banking service has been established on three Cunard liners, AQUITANIA, MAURETANIA and IMPERATOR, by the London Joint City & Midland bank, the largest private bank in the world. Considerable time and trouble can be saved under this arrangement by American tourists.

Digitized by Google

Activities in the Marine Field

Latest News From Ships and Shipyards

Expect Increase In Coal Shipments

BY H. C. MEADE

THE month of July closed with a fair increase in coal receipts. Ore docks have gained a little on the waiting fleet, which is not as large as it was a month ago, but the line up at lower lake ports is still big and boats are pretty badly bunched. The increase in the coal movement has not improved the car supply in the ore trade to any extent. Representatives of the shippers, railroads, and the interstate commerce commission have worked out a plan to bring the coal movement up to 4000 cars a day for the rest of the season. This is the mark that must be reached in order to meet the requirements of the northwest. Under the new plan, which has already gone into effect, all the mines will have to send part of their output to the lake front. A good coal movement would improve dispatch as the car supply would be increased and more boats would take up cargoes and would not get around so fast. Shipments of ore to lower lake ports in July were 9,638,606 tons, an increase of 465,177 tons over July, 1919, when shipments were 9,173,429 tons. The iron ore movement so far this season shows a loss of 3,530,053 tons compared with the corresponding period in 1918. Shipments of ore for the season up to Aug. 1 amount to 26,079,111 tons against 25,181,848 tons for the same time last year. Grain shippers at Lake Michigan ports are in the market for small tonnage. The freight market is quiet in all other lines with little chartering done.

* * *

The carferry PERE MARQUETTE No. 3, which was crushed by ice and went to the bottom about 3 miles from Ludington harbor last March, has been raised and towed behind the breakwater. The steamer will be patched and pumped out and taken to port for repairs.

* * *

Capt. Daniel Wilman, of the steamer BALTIC, which grounded near Cove island, Georgian bay, on July 9, was drowned the following day. He was with the Becker fleet for seven years, beginning as mate of the steamer V. H. KETCHUM. The stranding of the BALTIC was his first accident.

* * *

Capt. C. H. Franke died on Lake Superior aboard his boat, the steamer J. E. UPSON, of the Wilson Transit fleet, on July 15. He had been with the Wilson company about 20 years.

* * *

The United States shipping board steamer LAKE FRAMPTON was sunk in a collision with the steamer COMUS off Atlantic City, N. J., recently. Two members of the crew were lost. She was launched at the Lorain, O., yard of the American Shipbuilding Co. in October, 1918.

* * *

In endeavoring to avoid a collision with a sailing vessel and a sand steamer, the GLENLYON recent hit the dock of the Northern Navigation Co., Port Huron, Mich., causing considerable damage to it and the breakwater. The steamer was not damaged.

* * *

The Cleveland office of the Emergency Fleet corporation has been closed. All but six steamers and two tugs building for the corporation have been delivered. Four of the boats will be completed shortly. The business for this district is now handled at the Philadelphia office.

* * *

The steamer C. H. BRADLEY, upbound from Port Huron to Duluth with the barges MARY WOOLSON and MIZTEC in tow, ran into heavy weather off Thunder bay recently. The WOOLSON crashed into the BRADLEY soon after and became waterlogged and sank. The stern of the BRADLEY was badly smashed but she was able to make port. The MIZTEC was abandoned. The crews of the two barges were taken on board the steamer HURON of the Wyandotte Transportation Co., which went to the assistance of the BRADLEY.

* * *

Bids for repair work on the breakwater in Cleveland harbor have been received by the government engineer in that city. The work comprises the repairing of the rubble mound east breakwater and the placing of riprap in front of the west breakwater.

* * *

Capt. George B. Atkinson, who has been ill, has now taken command of the steamer THOMAS SHAUGHNESSY. Capt. L. S. Tilden has sailed the steamer since the opening of the season.

* * *

Negotiations are under way for the consolidation of the Goderich line, Northern Michigan Transportation Co., the Chicago, Racine & Milwaukee line, Wisconsin Transit Co., and the Milwaukee Transit Co. Fifteen vessels will be brought under one flag if the merger is completed.

* * *

The American Shipbuilding Co. recently sold the steamers L. M. BOWERS and M. E. FARR, two of the four 600-foot freighters building at the Lorain and Wyandotte yards, to G. A. Tomlinson, Duluth, and James E. Davidson, Bay City. The price was the largest ever paid for bulk freighters. The steamer BOWERS has been delivered but the FARR, which is building at the Wyandotte yard, will not come out until October.

* * *

The Detroit chamber of commerce is planning to construct a suspension bridge over the Detroit river between Detroit and Windsor, Ont.The bridge will have a span of 1770 feet and will carry railroad, street car, vehicular and pedestrian traffic. It is estimated that the cost will be $28,000,000, of which $10,000,000 already have been subscribed. Construction work, it is planned, will be started within a year.

* * *

The property of the Foundation Co., Port Huron Shipyard, Inc., Port Huron, Mich., was sold to H. L. Goldman, Detroit, at auction recently for $216,000. The property consists of river frontage of 1800 feet, a complete list of modern tools and machinery, steel buildings, and a 500-foot drydock with crane equipment.

* * *

The steamer H. H. PORTER was launched on July 30 at the Lorain yard of the American Shipbuilding Co. The PORTER, named after a director of the company, is the second of the four 600-foot steamers building on the company's account. Her keel was laid Jan. 29. She will be ready for service about Sept. 15.

* * *

The property of the Glens Run Coal Co., located in Belmont and Jefferson counties, Ohio, was recently leased by the Youghiogheny & Ohio Coal Co. A large part of the coal will be shipped to the lakes.

* * *

Dredge work in Erie harbor has been started. The United States dredge, BURTON, is there and will spend about 30 days cleaning up the channel.

* * *

As the steamer WILLIAM SIEMENS was picking up the barge JOHN FRITZ recently off South Chicago they collided. The FRITZ lost an anchor and broke a hawse pipe.

* * *

The steamer J. K. DIMMICK, owned by the Milwaukee Western Fuel Co., has been renamed the EDWARD U. DEEMER, for the nephew of Edward A. Uhrig, president of the company. The name of the steamer W. K. BIXBY, which was sold to Peter Reiss of the C. Reiss Coal Co., Sheboygan, Wis., early in the season, has been changed to the J. L.

Digitized by Google

REISS, in honor of the owner's brother, J. L. Reiss, New York.

* * *

The steamer MAPLEGROVE hit a pier at Port Dalhousie, Ont., on one of her recent trips down with grain. She was badly damaged.

* * *

The new steamer L. M. BOWERS, built at the Lorain yard of the American Shipbuilding Co., left July 31 on her maiden trip. She went to Duluth to load ore, where she took on 12,966 tons for Lake Erie.

* * *

A record ore cargo, 14,137 tons, was carried from Superior recently by the big Canadian steamer, W. GRANT MORDEN.

* * *

The passenger steamer STATE OF OHIO went ashore off Presque Isle recently. Eight passengers were taken off by the tug DICKINSON. The vessel was undamaged.

* * *

The Plum street dock, Erie, Pa., which has been idle for years, has again been put into commission. The first cargo unloaded and stored at the dock was that of the J. J. BARLUM. The operating company plans to store 300,000 tons of ore there during the rest of the year.

Along the Atlantic and Gulf Coasts

THE United Fruit Co. has a new service between Boston and the canal zone, with the SAN PABLO. Shipments from Boston port will include New England manufactured goods consigned to Peru, Chile and Ecuador.

* * *

C. H. Sprague & Sons, Boston, announce a new steamship service from Boston to the Far East. The service is to be provided by the Atlantic & Pacific Steamship Co., owned by W. R. Grace & Co., New York.

* * *

It is announced that the Boston Towboat Co., Boston, has under construction a new vessel. It will be 62 feet long, 17 feet beam and will be equipped with a single high pressure engine.

* * *

The Tropical Fruit Co.'s schooner GLADYS AND NELLIE was recently destroyed by fire at Antilla, Cuba. She was built at Gloucester, Mass., in 1909.

* * *

Crowell & Thurlow, Boston, recently placed an order with the Bath Iron Works, Bath, Me., for a steel steamship of 10,000 tons to be delivered within 10 months. She will be a duplicate of the steamer A. L. KENT now under construction at the same plant.

* * *

The submarine S-22 was recently launched at the Fore River plant of the Bethlehem Shipbuilding Corp., Quincy, Mass. Mrs. Nannie Rice Bowman, wife of Lieut. Com. M. C. Bowman of the bureau of engineering in Washington, was the sponsor. The S-22 was completely equipped at Quincy.

* * *

The United States shipping board will sell 81 of its tugs, including the PYLOS, KALEEN and TOOPI, which arrived at the Boston port recently from the Great Lakes. The board has already disposed of several of its smaller tugs, principally to New York towing concerns.

* * *

The Commercial Wharf Water Boat Co., Boston, has been organized by Howard V. Redgate of the Commercial Towing Co., Capt. F. G. Griffin and Engineer Charles Trask of the tug JENNIE and Capt. Charles O'Donnell of the tug VIM. They will operate the tugs JENNIE and VIM, with offices located at Commercial Wharf, Boston.

* * *

The steamer MELROSE which has been commandeered by the government since the beginning of the world war has recently been returned to the port of Boston.

* * *

It has been announced that, effective Aug. 1, fuel oil at the terminals of the canal zone was increased to $3.50 per barrel and bunkers will be limited to sufficient oil for a ship to reach the next bunkering station. This will apply to all ships whether they have contracts with local oil companies or not.

* * *

The steamer SPRINGFIELD was recently allocated to the North Atlantic Western Steamship Co. Inc., for service between Boston and the Pacific coast ports of Los Angeles, San Francisco and Seattle. The SPRINGFIELD is a new steamer built at Portsmouth, N. H.

* * *

Figures for the fiscal year ended June 30, 1920, show the total shipping built in the United States and officially numbered by the bureau of navigation to aggregate 2241 vessels, of 3,860,484 gross tons, compared with 2158 vessels of 3,734,741 gross tons during the previous fiscal year.

* * *

The shipping board steamer TILLAMOOK is undergoing repairs at Orange, Tex., having been towed there from New Orleans, late in July, by the steamer EDGEFIELD.

* * *

The Mississippi Shipping Co.'s steamer TULADI, operated under shipping board allocation, took the largest cargo of resin ever shipped out of the United States from New Orleans to Santos, Brazil, late in July. It consisted of 11,000 tons, and, in addition TULADI carried a large cargo of general merchandise.

* * *

Congested traffic conditions on the railroads have resulted in the shipment by water of hundreds of automobiles from St. Louis and Cincinnati to New Orleans dealers. The largest single shipment was of 200 cars on six barges, in the government service on the Mississippi river.

* * *

The bill to amend the present state pilot's licensing act in Louisiana, so as to break up the monopoly which 34 pilots have on all business coming up or going down the river, was defeated before the Louisiana legislature in July. Twenty-four of these men come from the same family, and the remaining 10 are related to the 24, and they pool all fees in one pot which they divide at the end of each month. To enter this service the man who aspires to be a pilot must first get permission from the pilots themselves to serve six months as an apprentice without pay, and then must wait his turn. So far every effort to force an increase in the number of pilots—an increase really needed by the business of the port—has failed. The matter will be considered in rewriting the state constitution at the constitutional convention, in February.

* * *

The United Fruit Co. has opened triweekly service between New Orleans and Port Limon, Costa Rica.

* * *

The river steamer LOCKPORT, valued at $25,000, owned by Capt. R. Gardere, and operated between New Orleans and Bayou Lafourche, sank in the river opposite New Orleans July 19, after striking a submerged piling. Efforts are being made to raise her from the 40 feet of water in which she lies.

* * *

The Pacific Steamship Co., of Baltimore, has purchased nine vessels of a total of 81,000 deadweight tons from the United States shipping board at prices ranging from $215 to $225 per deadweight ton, and will operate them between Baltimore and Seattle, via the Panama canal. The deal was closed July 17, and one of the steamers has been delivered. This is the CAPE ROMAIN, which left Los Angeles, July 25, for Baltimore. Among the other eight ships are WEST APAUM, ABSAROKA, LIBERATOR, CAPE HENRY, CAPE MAY, BERWYN and WEST CARNIFAX.

* * *

The J. H. W. Steele Co., New Orleans, announces the inauguration of direct steamship service to ports on the west coast of both the Americas, starting with the clearing of ELDORADO, a 3500-ton steel steamer, early in August. The route will be via the Panama canal and north and south from the western entrance to the canal.

* * *

New Orleans took second place among the ports of the United States on the basis of its May imports and exports, which totaled $773,613,600, according to a report issued July 15 by the bureau of foreign and domestic commerce. Boston went to third place, with $677,085,134, and Philadelphia came fourth with $618,461,942. New Orleans imports for May, 1920, were nearly $10,000,000 more than

Digitized by Google

for the same month in 1919, but the exports fell nearly $4,000,000 below those of May, 1919.

* * *

The strike of the 7000 metal trades workers, which tied up shipbuilding in June and July, was ended by compromise near the end of the latter month, the men returning to work at 90 cents an hour for mechanics and 60 cents for helpers. The strikers, when they walked out, demanded $1 an hour for journeymen and 75 cents an hour for helpers.

* * *

Reports to New Orleans shipping agencies indicate that the strike of longshoremen at San Juan, Porto Rico, which was called April 26, has been ended by the men returning to work at the old wages and under the old conditions.

* * *

Capt. James B. Smith, who had run on the Mississippi and Ohio rivers for approximately 50 years, died in a hospital in Paducah, Ky., July 12.

* * *

Martin & Gardner, New York, naval architects and appraisers, who have taken charge of all surveys of vessels operated out of gulf ports, for the United States shipping board, and the American marine insurance companies, have opened offices in New Orleans. They will make four surveys of each vessel each year. William B. Ferguson, Philadelphia, brother of Homer L. Ferguson, president of the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., has charge of the New Orleans office, which is at 1015 Carondelet street.

* * *

L. J. Folse, president and general manager of the Marine Forwarding & Shipping Co., New Orleans, is on an extended business trip to New York, Cincinnati, Philadelphia, Chicago and St. Louis.

* * *

Ninety-six vessels in the port of New Orleans, loading and unloading on June 30, set a record for the largest number of boats so engaged in the history of the port.

* * *

The Lloyd Royal Belge Steamship Co. has established passenger service between New Orleans and Antwerp, by the steamer OLYMPIER, 8400 tons, which has arrived in New Orleans on her maiden voyage from Glasgow. She cleared on her first passenger-carrying voyage from New Orleans on Aug. 10. F. C. Gylsen, New Orleans, is manager for the Lloyd Royal Belge.

* * *

The Mississippi Shipping Co., which operates the Delta line of steamers to South American ports, added the LORRAINE CROSS, 7825 deadweight tons, recently built at Hog Island, to its fleet at New Orleans in July. She started her maiden voyage early in August to Brazilian ports with general cargo.

* * *

The small steamer ALERT, operating between New Orleans and ports on the north shore of Lake Pontchartrain, was burned to the water's edge in the New Basin canal late in July. She carried 15 automobiles, all of which were damaged by the fire, some of them being total losses, and considerable livestock, which escaped by swimming ashore in the canal. Loss was about $30,000.

Activities Along the Pacific Coast

THE divorcing of the Seattle and Portland, Oreg., shipping board offices from the jurisdiction of San Francisco, with the new headquarters in Seattle, is eminently satisfactory to shipping interests in Oregon and Washington. This change has long been desired. Heretofore, all shipping board matters were referred to Washington through the San Francisco headquarters resulting in delay and inconvenience.

* * *

The visit to Alaska in July of Secretary of the Navy Daniels and Secretary of the Interior Payne is expected to be of benefit to the entire western country. The secretaries were deeply impressed with what they saw. They went over the coal fields of the interior and announced that these mines will be developed. It is planned to establish a coaling station along the Aleutian group which will be of great benefit to vessels in the transpacific trade. The development of water power interested Secretary Payne and the establishment of new industries in the north is expected to be facilitated.

* * *

In filing a brief asking permission to raise rates from interior northwest points destined for California destinations, the Pacific Steamship Co. shows that it is costing $8.54 a ton to handle this business while the revenue is only $6 per ton. The company claims that these rates are lower than similar rates on the Atlantic. The company cites the rapidly increasing cost of operation as the principal reason for the need of greater revenue.

* * *

The best record for a sailing ship between San Francisco and Sydney, Australia, in the past nine years was made by the barkentine ANNE COMYN, which negotiated the long route in 52 days. The fact that the ANNE COMYN is a shipping board hull, converted into a barkentine, is cited as a splendid advertisement for wooden hulls built under shipping board plans.

* * *

For the first time in more than two years, no delay is now being experienced in the transmission of messages to and from the Orient. This condition has given general relief to commercial interests at Seattle as for months the cables were so congested as to be of little use.

* * *

Grays Harbor, Wash., is celebrating the coming of a large steel shipping board steamer, the WEST NIVARIA, which recently arrived from the Orient. The 8800-ton carrier crossed in and out over the bar without difficulty. She loaded a part cargo of lumber for the Orient.

* * *

Three vessels of the fleet built by the Canadian government for service between Vancouver, B. C., and Australia, are already in commission. These carriers are taking lumber and other Canadian products returning with general cargo from Australia, New Zealand and Suva. Six others are approaching completion at British Columbia yards.

* * *

The export business of Portland, Oreg., gained 34 per cent during the first six months of 1920 as compared with 1919. Exports during the first half of the present year amounted to $30,700,000.

* * *

Weather conditions in Norton sound, on which Nome, Alaska, is situated, have been unusually severe this summer. During June, the ice remained close to the shore compelling steamers to remain far out at sea. Recently heavy storms have delayed all steamers making Norton sound and Kotzebue sound ports.

* * *

Fish pirates are reported to be active, raiding the traps in southeastern Alaska. Government patrol vessels are in northern waters but the thieves have been unusually bold this season, and have made some valuable hauls.

* * *

The Seattle-built wooden schooner BIANCA recently arrived at Port Natal, Africa, 175 days out from Victoria, B. C. This is an unusually long passage and considerable anxiety was felt for the vessel's safety.

* * *

The port of Seattle is prepared to handle 1,900,000 cases of canned salmon, valued at $20,000,000 this season. The first of the pack has arrived and every steamer for the next five months will bring consignments of this freight.

* * *

A heavy movement of railroad ties to England is under way, two large steamers having been dispatched with over 5,000,000 feet each. The tie order is for 38,000,000 feet from both Puget sound and the Columbia river.

* * *

Another famous Bath-built clipper, the CHARLES E. MOODY, has made her last voyage. The MOODY was burned to the water's edge at Bristol bay recently. She was owned by the Northwestern Fisheries Co., Seattle, and for a number of years had been used in the cannery trade out of that port.

Digitized by Google

Practical Ideas for the Engineer

Rules for Calculating Tonnage—How Present Methods Have Been Evolved—Influence of Rules on Ship Design

BY LIEUT. COMMANDER CARL H. HERMANCE, U. S. N. R. F.

THE term tonnage appears to have originated from the tun, cask of wine, the earliest system of measuring vessels being simply to count the number of casks or tuns of wine which could be carried and thus obtaining a measure of the internal capacity.

In the reign of Henry V, A. D. 1422, the first act dealing with the measurement of vessels of which any record can be found, required "Keels that carry coals at New-castle to be measured and marked," but it is not known how the measurement and markings were at that time carried out. In the year 1679, an act of the British parliament extended the above regulation to the Wear, and prescribed that the Bowle Tub of Newcastle, containing 22½ gallons Winchester measure, and "allowing 21 bowls of coal to be measured by such Bowle Tub by heap measure," in measuring these river craft should always be used.

The "keels" were marked by nails upon the bulkheads at each end of the cargo space, or by driving nails into the stem and stern-post to indicate the corresponding load draft.

In the year 1694, another act of the British parliament was passed for the measurement of keels, and a weight was then fixed upon as a standard, instead of a measure. This act required "keels to be measured by putting into them dead-weights of iron or lead, allowing 53 hundredweights to every chaldron of coals, and a maximum load of 10 chaldrons or 26½ tons." The load-line was then marked on the stem, stern and each side amidships.

By an act passed in 1775, the foregoing regulations for the Tyne and Wear were extended to vessels loading coal at all other ports of Great Britain, but the ton of 20 hundredweight avoirdupois was then made the standard weight, instead of the chaldron weight. The foregoing remarks relate to river craft only.

First Rule of Measurement

The measurement of ships, as distinct from the rough estimates of tonnage which are found in early records, appears to date from the first part of the seventeenth century, and the earliest rule which can be found is that given in Admiral Sir William Monson's tracts, published after his death in 1642. It is termed "A rule to know the burden of a ship: length of keel, 120 feet; breadth in beam, 40 feet; depths in hold, 20 feet; 40×20×120=96,000 and 96,000÷100=the burden, 960 tons." From a book entitled *The Complete Shipwright*, written by Bushnell in the seventeenth century, we learn that the shipwrights of London on the River Thames had a custom of calculating the tonnage of a vessel by the following rule: "They multiply the length of the keel into the breadth of the ship at the broadest place, taken from outside to outside, and the product of that by half the breadth. This second product of the multiplication they divide by 94, or sometimes 100, and according to that division they are paid for so many tuns."

Bushnell proposed to ascertain the true measure of a ship's ability to carry, by first marking the water line when ready for sea without any cargo on board, afterward marking the lead-line, and then measuring the cubic content of the body of the ship between these lines.

This appears to be the earliest recorded suggestions of a method of measuring displacement between the light- and load-lines, but the manner in which it was proposed to estimate this displacement was a crude one.

It will be observed that the rule quoted differed from Monson's by substituting half of the breadth for the depth of the hold. This was a change much for the worse, but probably the half breadth was taken because the depth could not be measured when the vessel was laden, and for the ships built about the time the assumed proportion of the breadth to depth was a fairly correct average.

The first tonnage rule embodied in the act of the parliament of England was that given in the act of 1694, which levied certain duties upon seagoing and coasting vessels, and is as follows:

$$\text{Tonnage} = \frac{L \times B \times D}{94}$$

where

length L is length of the keel taken within board (so much as she treads the ground).

B is the breadth within board by the midship beam, plank to plank.

D is the depth of the hold from plank below keelson to the under part of the upper deck planks.

Two years later the tonnage dues on shipping were repealed, and in that year (1696) the first act providing for the registry of shipping appears to have been passed.

In 1720, a rule for the measurement of vessels, which was ultimately known as builders' tonnage, was first legalized in an act intended to prevent smuggling, by prohibiting small vessels of "30 tons burden and under from carrying spirits." This rule differed from that given in the act of 1694, in that half the breadth was substituted for the depth, thus making the rule the same as that previously referred to as the practice adopted by the Thames shipbuilders.

Fostered Poor Ship Designs

In 1773, a general rule for the measurement of all merchant vessels was made by Act 13 George III, and this, with some slight modifications, continued in force till 1835, and had a most evil effect upon naval architecture. This rule is as follows:

$$\text{Tonnage B. O. M.} = \frac{(L - \frac{3}{5}B) \times B \times B}{94}$$

where

length L is taken on a straight line along the rabbet of the keel from the back of the main sternpost to a perpendicular line from the fore part of the main stem under the bowsprit.

B is the breadth from outside to outside plank in the broadest place in the ship, be it either above or below the main wales, exclusive of all manner of doubling planks that may be brought upon the sides of the ship.

The principal difference between this rule and that given in the act of 1720 is the manner of taking the length, which the latter act defined as "so much as treads on the ground"; and as this was probably uncertain in practice, the new length for tonnage was obtained by deducting three-fifths the breadth from the length.

Thirteen years later, the act of 1773 was supplemented by the law for measuring the length of a vessel when afloat. The length was to be taken on the load water line from the back of the stern-post to the front of the main stem, and subtracting from it 3

Reprinted from the *Proceedings* of the U. S. Naval institute.

Digitized by Google

inches for every foot of the load draft of water for the rake abaft, and three-fifths of the ship's breadth for the rake forward, the remainder being the length of the keel for the tonnage.

The effects of the foregoing tonnage rule are generally known; the tendency of a rule which only took into account the length and the square of the breadth being naturally to produce deep, narrow ships, which were not only unhandy, box-shaped vessels, but positively dangerous from their liability to capsize.

The old law of 1694, which took the depth into acount, also caused vessels to be built with very full lines, and long after the tonnage rule known as builders' old measurement had been suspended by the new measurement its evil effects remained, for the shipbuilders continued to use it to describe their ships, and to build the deep dangerous vessels to show a large carrying capacity compared with the builders' tonnage. In 1821, a committee was appointed to revise the tonnage laws, and this committee reported that they would have liked to propose the measurement of the portion of the ship included between the light- and load-lines, but that this method was "liable to insuperable objection on account of the impossibility of ascertaining the position of these lines in a satisfactory manner."

They proposed, however, a rule of internal measurement, in which the mean of five breadths and two depths was taken; these multiplied together and by the length and the product divided by 112 gave the tonnage.

No legislation was ever attempted upon the report of this committee.

Determining Internal Capacity

In 1833, another committee was appointed by the admiralty and the result of their investigations was the tonnage rule known as the "new measurement," embodied in Acts 5 and 6 William IV, 1835.

This rule aimed at obtaining the internal capacity of a vessel by the smallest number of measurements, and the use of such a divisor as would give an average result equal to that by the old rule.

The rule may be summarized as follows:

1st. For vessels measured with a clear hold.

(*a*) The length of the upper deck between after part of stem and fore part of sternpost was divided into six equal parts.

(*b*) The depths were measured at the foremost, middle and aftermost points of division from under side of upper deck to the ceiling at the timber strake.

(*c*) Each of these three depths was divided into five equal parts, and the inside breadth measured at one-fifth and four-fifths from the upper deck of the foremost and aftermost depths and at two-fifths and four-fifths of the midship depth.

(*d*) The length of the vessel was measured at half the midship depth from after part of stem to fore part of sternpost. Then twice the amidship depth added to the foremost and aftermost depths was termed the sum of the depths. The upper and lower breadth of the foremost division added to three times the upper breadth and the lower breadth at the midship division and the upper and twice the lower breadth at the after division gave the sum of the breadth.

The sum of the depths multiplied by the sum of the breadths and then by the length and the product divided by 3500 gave the register tonnage.

The tonnage of the poop or half-deck was found by dividing the product of the mean inside length, breadth and depth by 92.4.

2d. For vessels measured while loaded.

$$\text{Tonnage} = \frac{L \times B \times D}{130}$$

where

L is length of upper deck from after part of stem to fore part of sternpost.

B is inside breadth on under side of upper deck at middle of length.

D is depth from under side of upper deck down the pump well to the skin.

The tonnage of a poopdeck or raised deck was found by the rule already given and added to the result found by the above formula.

In either of these rules the allowance for engine space in steamers was the product of the length between the two bulkheads, the depth of the side amidships and the inside breadth at two-fifths the depth from the deck, divided by 92.4, and the quotient was deducted from the gross tonnage.

The "new measurement" rule remained in force till 1854, but gave rise

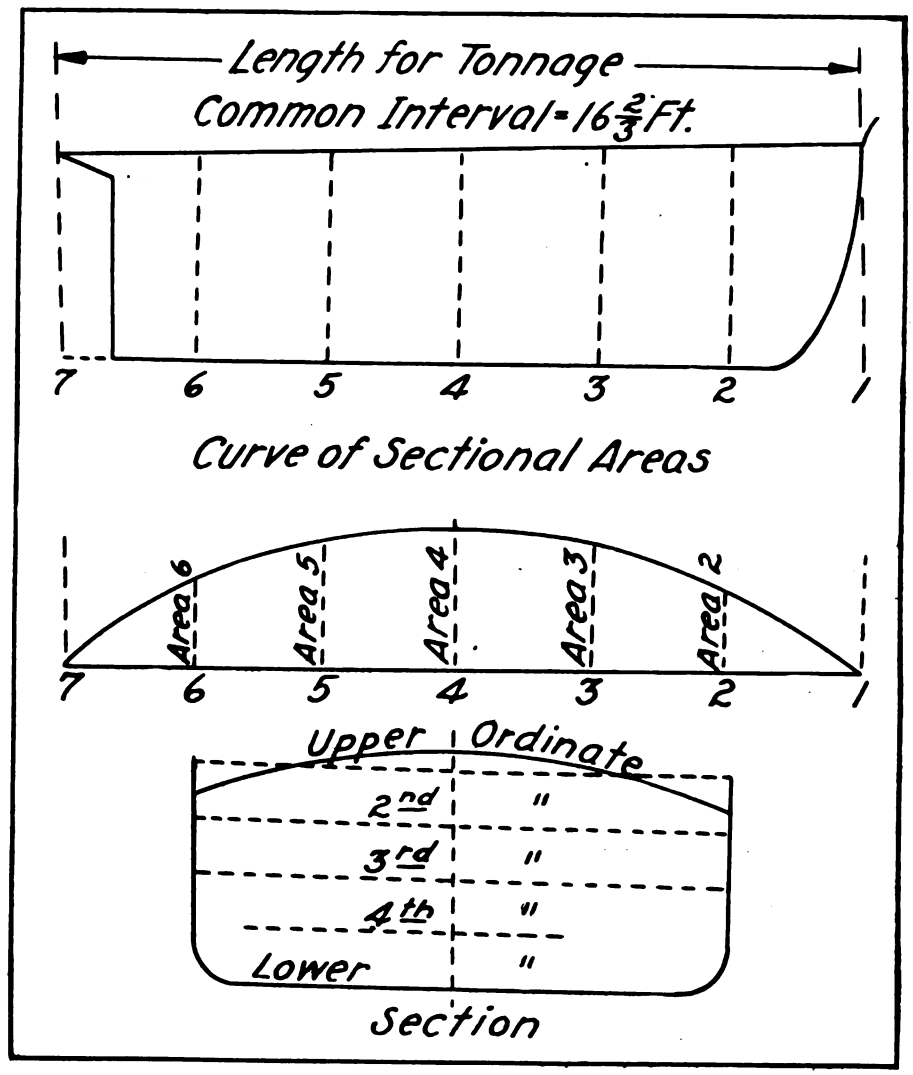


FIG. 1—DIVIDING LENGTH AND BREADTH OF VESSEL FOR MEASUREMENT

Digitized by Google

to a great deal of dissatisfaction, and was never popular.

A third committee was appointed in 1849, and they recommended that tonnage should depend upon the entire cubic content of a vessel measured externally and including poop, forecastle and other covered-in spaces. Transverse sections were to be measured, and a curve constructed in which the ordinates represented to scale the area of each section, and the cubic content was found by calculating the area of this curve. The result was to be divided by 35, and then multiplied by 0.27, a factor chosen to give a result equal to the average result of the old law. A bill was introduced into parliament in 1850 to give effect to these recommendations, but met with so little favor that it was withdrawn.

Basis of Present Laws

Mr. Moorsom then proposed, in the latter part of 1850, a scheme for the calculation of tonnage based upon internal measurement, so as to obtain the correct internal capacity of vessels, a register ton being 100 cubic feet of internal measurement. The divisor 100 was fixed upon, both for its convenience and to give a result practically corresponding with that under the old law.

This scheme is embodied in the merchant shipping act of 1854, which with some modifications in details is the existing law for tonnage measurement, and the rules laid down in the act of 1854 may be briefly stated as follows:

The tonnage deck is the upper deck in vessels with less than three decks, and the second deck from below in all other ships.

The length is measured in a straight line along the upper side of the tonnage deck from inside of inside plank (average thickness) at the side of stem to the inside of the midship stern timber or plankther, as the case may be (average thickness), deducting what is due to the rake of the stern timber in the thickness of the deck and in one-third of the round beam, and the length so obtained is divided into a number of equal parts according to the following table:

Length, feet	Divide into equal parts
Under 50	4
Above 50 not exceeding 120	6
Above 120 not exceeding 180	8
Above 180 not exceeding 225	10
Above 225	12

At these points in the vessel's length a transverse vertical section of the internal volume is then measured by the following method:

The depth at each point of division is measured from a point one-third the round of beam below the deck, or, in the case of a break, from a line stretched in continuation thereof to the upper side of the ceiling, and if the depth as taken at the midship division does not exceed 16 feet, each depth is divided into four equal parts, and the horizontal breadths measured at each of the points of division, and also at the upper and lower points of the depth, the breadth being taken to the inside of ceiling, allowing an average thickness. By the application of Simpson's first rule, the area of each transverse section is then found by multiplying the second and fourth breadth by 4, and the third by 2; these products added together to the first and fifth breadths, and the sum multiplied by one-third the common interval, give the area. If the midship depth exceeds

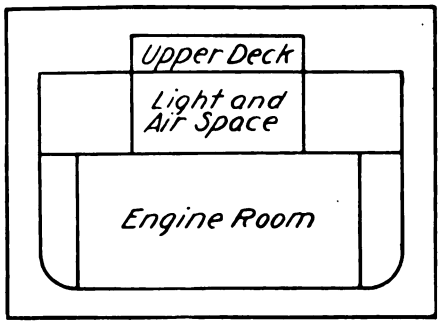


FIG. 2—MEASURING ENGINE ROOM LIGHT AND AIR SPACES

16 feet, each depth is divided into six equal parts, the second, fourth and sixth breadths are multiplied by 4, the third and fifth by 2 and these products added to the first and seventh breadths, and this multiplied by one-third the common interval, give the area.

Having obtained the area of each transverse section, the register tonnage is computed as follows:

Number the areas, 1, 2, 3, etc., No. 1 being at the extreme limit at the bow and the last number the extreme limit at the stern; then multiply the second and every even-numbered area by 4, and the third and every odd-numbered area, excepting the first and the last, by 2, add these products together and to the sum add the first and last if they yield anything; multiply the quantity thus obtained by one-third the common interval between the areas, and the product will be the cubical contents of the space under the tonnage deck; divide this product by 100, and the quotient will be the tonnage under the tonnage deck.

Fig. 1 illustrates the manner in which the length and depth of the vessel are divided for measurement.

In vessels fitted with partial double bottoms for water ballast and also in cases where the inner bottom is not horizontal, but sloping upward toward the side, additional subdivisions and measurements are made in order to calculate the internal capacity of the vessel.

Peak tanks, constructed for carrying water ballast only, and not available for cargo or stores, are, under certain conditions, allowed to be deducted from the gross tonnage.

Having ascertained the tonnage under the tonnage deck, there are various additions to be made to obtain the gross register tonnage, and deductions to be made from the gross to give the net register tonnage, upon which dues and charges are based.

The act provides that if there be a break or poop or any permanent enclosed-in space on the upper deck available for cargo or stores or for the berthing or accommodation of passengers or crew, the tonnage shall be ascertained thus: Measure the internal mean length of such spaces in feet and divide it into equal parts; measure at the middle of its height three inside breadths—namely, one at each end, and the other at the middle of the length, then to the sum of the end breadth add four times the middle breadth and multiply the sum by one-third the common interval between the breadths; the product will give the mean horizontal area of such space; multiply this product by the mean height, and divide by 100, and the quotient will be the tonnage which is to be added to the under deck tonnage, subject to the following provision, that nothing shall be added in respect of any building erected for the shelter of deck passengers, and approved by the board of trade.

Rules for Extra Decks

If the ship has a third deck, the space between it and the tonnage deck is found by dividing the length into the same number of intervals as used in computing the tonnage under the tonnage deck, and having found the mean horizontal area of the space by the rule already given, this mean area multiplied by the mean height and divided by 100 gives the tonnage of the 'tween deck space, to be added to the tonnage already found for the portion below the tonnage deck; and if the vessel has more than three decks, the tonnage of each space between decks above the tonnage deck is similarly calculated.

Hatchways over cargo holds are also measured, and any excess above 0.5 per cent of the remaining gross tonnage is added to the gross tonnage.

The merchant shipping act of 1854 also gives a rule for ascertaining approximately the tonnage of a vessel "measured for any purpose other than registry," and having cargo on board;

Digitized by Google

also to ships measured for registry, but to which it is impossible to apply rule I.

Rule II is as follows for wooden ships:

$$\text{Tons under deck} = \left(\frac{G+B}{2}\right)^2 \times L \times .0017,$$

where

L is length on upper deck from outside of outer plank on stem to perpendicular line from aft of rabbet in sternpost, just below where the counter plank crosses it.

B is extreme outside breadth of ship.

G is outside girth of ship from height of upper deck at one side to height of upper deck on opposite side.

The girth is taken by means of a chain passed under keel of the ship.

For an iron ship the same rule is used, but the final multiplier is 0.0018.

To the result found as above has to be added the tonnage of poops or other spaces above the upper deck, which is simply found by dividing the product of the mean length, breadth and depth by 100.

In the act of 1854 the multipliers for wooden and iron ships were, respectively, 0.0018 and 0.0021, but as these were found to give results largely in excess of rule I, the factors were altered in 1858 to those given above.

The principal use of rule II was to find the tonnage of foreign vessels for payment of dues previous to the adoption of the Moorsom system by other nations.

Net Register Tonnage

From the gross tonnage found, as already indicated, there are certain deductions to be made in order to obtain the net register tonnage.

The allowances on account of propelling space are briefly as follows:

Paddle vessel, in which the tonnage of the space solely occupied by and necessary for the boilers and machinery is above 20 per cent and under 30 per cent of the gross tonnage; in screw steamers, in which the tonnage of such space is above 13 per cent and under 20 per cent of the gross tonnage, a deduction of 32 per cent of the gross tonnage is allowed.

As regards all other ships that are under or over above percentages, the actual space occupied by boilers and machinery may be measured, and in paddle vessels the allowance is 1½ times the actual space, and in screw steamers 1¾ times the actual space. In screw steamers the contents of the shaft trunk are deemed to form part of the engine and boiler space.

By the merchant shipping (tonnage) act 1907, the allowances for propelling space will in the future be limited for all vessels (except those used exclusively as tugs) to 55 per cent of the tonnage remaining after deducting from the gross tonnage any deductions allowed under Section 79 of the principal act, for master's and crew's accommodations, navigation spaces, boatswain's stores, donkey engine and boiler, peak tanks, etc.

Allowance for Crew Space

The rule for measuring engine and boiler space provided for the inclusion of light and air spaces above the crown of the engine room and the intention of the act was clearly to provide for such spaces, as indicated in Fig. 2. Spaces were, however, framed in above the upper deck, as shown, but by the act of 1854 could not be measured in the gross tonnage.

In 1879 the owners of the steamer

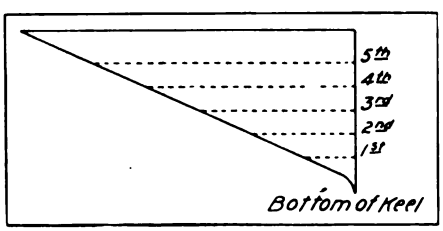


FIG. 3—CURVE OF DISPLACEMENT

ISABELLA contended that this upper space should be included in the engine room space, and their claim was allowed as being justified by the terms of the act. A reduction in tonnage was consequently obtained on this ground, but this was corrected in the act of 1889, which provides that in the future such spaces as those indicated must be included in the gross tonnage.

Besides the allowance for propelling power in steamers, all vessels may have a deduction made on account of crew space.

To obtain the allowances under this heading the crew space must be inspected and approved by a surveyor appointed by the board of trade, and provided not less than 72 cubic feet of space or 12 feet of deck area are set apart for each seaman or apprentice. An act passed in 1867 allows the actual cubic content of all spaces occupied by the crew except the master to be deducted from the gross tonnage.

In the act of 1854 all spaces above the upper deck for the sole accommodation of the crew were exempted from measurement; but the act of 1867 provided for the exemption of crew spaces below the upper deck, and omitted to repeal the exemption under the act of 1854.

The effect of this was that if the crew were berthed above the deck the space occupied was exempted from measurement by the act of 1854, and then by the act of 1867 allowed to be deducted from the gross tonnage; or, in other words, allowed for twice. The owners of the steamer ISABELLA, already referred to, raised this point in 1879, and obtained judgment in their favor and since then a number of other vessels have obtained similar reductions in the net register tonnage.

The act of 1889 repealed the clauses of the act of 1854 dealing with "crew spaces," so that in future no reduction will be made for such spaces, unless they first have been included in the measurement of gross tonnage.

This act also provides for the following deductions:

1. Sailing ships: Any space exclusively used for storage of sails, not exceeding 2½ per cent of the gross tonnage of the ship.
2. Any ship:
   - (*a*) Any space used exclusively for the master.
   - (*b*) Any space used exclusively for the working of the helm, capstan and anchor gear, or for keeping charts, signals, and other instruments of navigation and boatswain's stores.
   - (*c*) The space occupied by the donkey engine and boiler, if connected with the main pumps of the ship.
   - (*d*) Any other space (other than double bottom) adapted only for water ballast.

These deductions are allowed provided the spaces referred to are certified by a board of trade surveyor as reasonable in extent and efficiently constructed, and they must be permanently marked so as to show the purpose for which they are intended.

Measuring Deck Cargo

By the merchant shipping act of 1876, provision is made for the measurement of space occupied by deck cargo as follows: If any ship engaged in the oversea trade carries cargo in any space on the upper deck which has not been measured under the act of 1854, the tonnage of the space occupied by the cargo is to be measured and added to the taxable tonnage. This regulation gives a variation in the taxable tonnage from one voyage to another. The usual definition of home trade taken in this act, is the coasts of the United Kingdom and those of the continent from the Elbe to Brest.

The Danube international commission adopted in 1860 the Moorsom system of measurement, and subsequently accepted a method of allowance for propelling space as follows:

The actual machinery space was measured exclusively of bunkers, and 1½ times that space allowed for paddle steamers and 1¾ times for screw steamers, subject to the total allowance not exceeding 50 per cent of the gross tonnage, except in tugs. This is usual-

Digitized by Google

ly termed and known as the Danube rule.

Another rule, known as the German rule, is to measure the coal bunkers as well as the machinery space, and to allow the total space thus occupied provided it does not exceed 50 per cent of the gross tonnage, except in tugs.

In 1873, an international commission on tonnage met at Constantinople to deal with the subject of the Suez canal dues, and although they adopted the Moorsom system of measurement, they made more stringent regulations as to the measurement of deck erections and allowance for engine space. Double bottoms for water ballast, whether constructed on the cellular or MacIntyre system, are exempted from measurement in the same manner allowed by the English law.

The Suez canal rules for measurement of deck erections will not be discussed here as they can easily be learned from those rules.

The Danube commission accepted, in 1876, the Suez canal rules, so that the same certificate is now available for both.

In vessels with fixed coal bunkers, the German rule may be used for obtaining the allowance for propelling space, while vessels with shifting bunkers are measured by the Danube rules, and the maximum allowance for crew spaces, galley spaces, W. C.'s and navigation spaces is 5 per cent of the gross tonnage.

The Moorsom tonnage measurement has been adopted by most of the maritime nations of the world, although the allowances for engine space differ in some cases, and the crew space deductions for nearly all countries are limited to 5 per cent of the gross tonnage.

Freight tonnage is simply a measure of cubical capacity, a freight ton being 40 cubic feet of space. This tonnage has no legal authority, but is largely used by merchants and shipowners as a measure of the capacity of vessels.

Register tonnage is a measure of a vessel's internal capacity, a register ton being 100 cubic feet of internal space.

Displacement is a measure of the weight of a vessel and her outfit and cargo, a ton of displacement being 20 hundredweight avoirdupois.

The weight of a floating body is equal to the weight of fluid displaced, and in order, therefore, to ascertain the weight of a vessel and her contents at any given draft, it is only necessary to calculate the weight of the volume of fluid displaced.

As the register tonnage is that upon which a vessel has to pay dock and other dues, while the deadweight carrying capacity represents the earning power of an ordinary cargo vessel, it is obvious that from a shipowner's point of view the most profitable vessel is the one which can carry the greatest amount of cargo in relation to her register tonnage.

The method of estimating the official tonnage known as the "builder's old measurement rule" in which the square of the breadth entered into the calculations while the depth was neglected fostered the building of dangerously narrow and deep ships with very full forms, so as to produce a large carrying power with a comparatively small official tonnage.

The present tonnage laws aim at ascertaining accurately the internal capacity of the vessel, and there is not now the same inducement to build such badly proportioned ships.

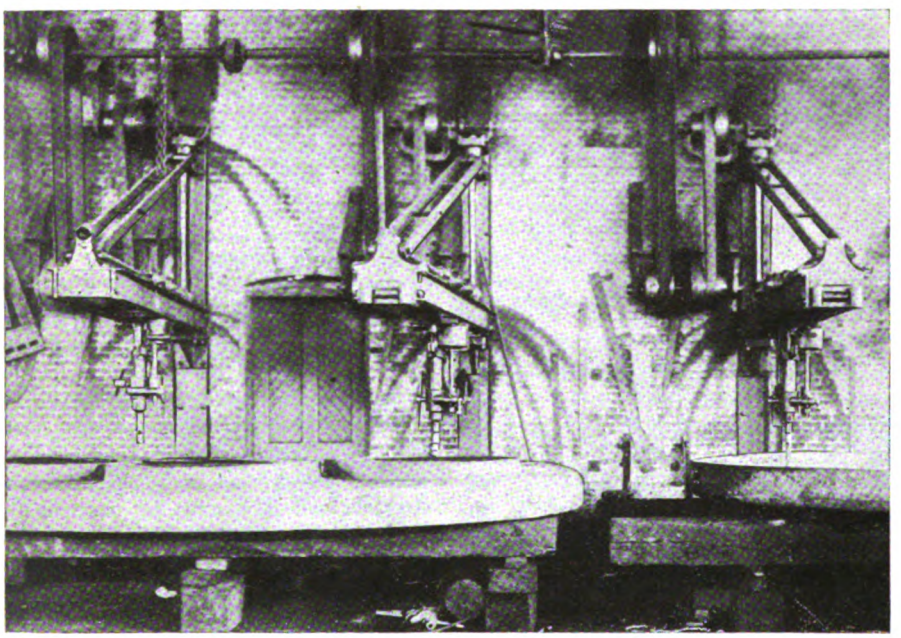
The displacement of a vessel is calculated from the drawings, and the method of calculation is similar in principle to that adopted for the measurement of the internal capacity; but the naval architect is not fettered by any definite number of subdivisions as laid down in the tonnage laws.

The area of each section is calculated by means of Simpson's rules and the areas of these sections then treated as ordinates of a curve of sectional areas, the result being the volume in cubic feet. To this volume must be added the volume of any appendages, such as keel, rudder, etc., so as to obtain the total volume displaced.

Thirty-five cubic feet of salt water weigh 1 ton; if, therefore, the volume in cubic feet be divided by 35, the result will be the displacement in tons.

It is usual in carrying out this calculation to arrange the ordinates of the various sections and waterlines on a sheet in such a manner that the areas of each may be readily ascertained and at the same time to calculate the center of buoyancy, or the center of gravity of fluid displaced, and to construct curves of displacements and tons per inch immersion.

The curve of displacement is constructed by setting off the displacement as calculated at different drafts (mean), or ordinates of a curve on any convenient scale, so that the displacement at any intermediate mean draft may be ascertained without the labor of separate calculations, by simply measuring with the same scale the length of the ordinate at any given draft. The curve of displacement is usually as shown in Fig. 3, and is, of course, only to be used for obtaining the displacement at any mean draft of a vessel on a fairly even keel. The displacement at any exceptional trim would have to be calculated separately.



DRILLING RIVET HOLES IN HUGE BOILER HEAD

Rolls Big Boiler Head

The largest, single-piece boiler head ever made was recently rolled in the Coatesville, Pa., mills of the Lukens Steel Co. for the Bath Iron Works, Bath, Me. The illustration shows the drilling of rivet holes for two of these boiler heads. These were flanged at the mills. The circular plates from which they were made were 199½ inches in diameter before turning the flange. The material is $\frac{15}{16}$-inch thick and the completed head weighs 8820 pounds. After turning the flange, the outside diameter was 183 inches. The boilers when completed are to be used in vessels now building at the Bath Iron Works.

Digitized by Google

Handling Bulk Cargoes On Coast

Improvements Are Being Made in Methods of Loading and Unloading Coarse Freight—New Equipment Ordered

IN THE past four years, several factors stimulated interest among shippers of heavy bulk materials in a cheaper and more rapid scheme of handling such commodities. The manufacturers of apparatus, especially the pioneers in this line, started a movement in this direction some 20 years ago, and succeeded in getting a limited number of plants installed as early as 1902. The development of plants for handling large tonnages of coal and iron ore was the most obvious necessity and it was naturally the first problem attacked on a large scale. The necessity for such development centered around the Great Lakes region and the pioneer installations were put in that vicinity.

The short season of navigation for carrying ore from the Minnesota, Wisconsin and Michigan fields to the blast furnaces of the lower lakes and the Pittsburgh district, requires a movement of 12 months's supply of ore in about seven months. The coal supply of the states bordering on the iron ore region is largely taken from the lower lakes on the return trip of the ore boats. In order to perform this task with the minimum of equipment and at lower operating costs per ton, it was plainly necessary to provide machinery for cheap and rapid discharge of cargo from ship to dock or railroad and vice versa, the length of time the ship was tied up to the dock being a vital factor in costs. The result has been a high state of development and concentration of bulk cargo handling plants in the lake region.

In the late nineties, the Wellman-Seaver-Morgan Co., Cleveland, brought out its ore unloader, each machine being capable of handling ore at from 500 tons per hour upward. At about the same time the car dumper, for overturning standard railway cars and dumping their contents, was developed. The latter have been evolved until at present they will handle 30 dumps per hour and upward, some installations handling as much as 3000 tons per hour of net material, two cars in tandem.

Conditions largely due to the great war caused a more general interest to be developed along the coasts in these methods. Prior to America's participation in the war, a few installations had been made on the Atlantic coast especially in the line of loading cargo and bunker coal. Rising labor costs and necessity of rapid "turn around" on the comparatively few vessels available brought the issue of improved dock facilities to the forefront. It was a question of time, tonnage capacity over a given waterfront, and cost per ton. All the above items in the problem are satisfactorily answered by equipment of the type previously mentioned, and solve what is still more vital, the item of labor, which in normal volume is unobtainable at any price.

Two contracts recently secured by the Wellman-Seaver-Morgan Co. on the Atlantic coast are interesting at this time. A contract with the Lehigh Valley railroad covers an automatic ore unloader carrying a 15-ton clamshell bucket on the unloader leg and designed to make a complete cycle or round trip in 50 seconds. The machine, electrically operated throughout, is illustrated in Fig. 1. This view, together with Fig. 2, illustrates the general appearance of similar apparatus in action.

The automatic unloader illustrated is unique in design and has proved through many years of service to be one of the most successful devices for unloading ore cargoes from steamers with suitable hatches that has ever been devised. Although of immense proportions, the design has been sim-

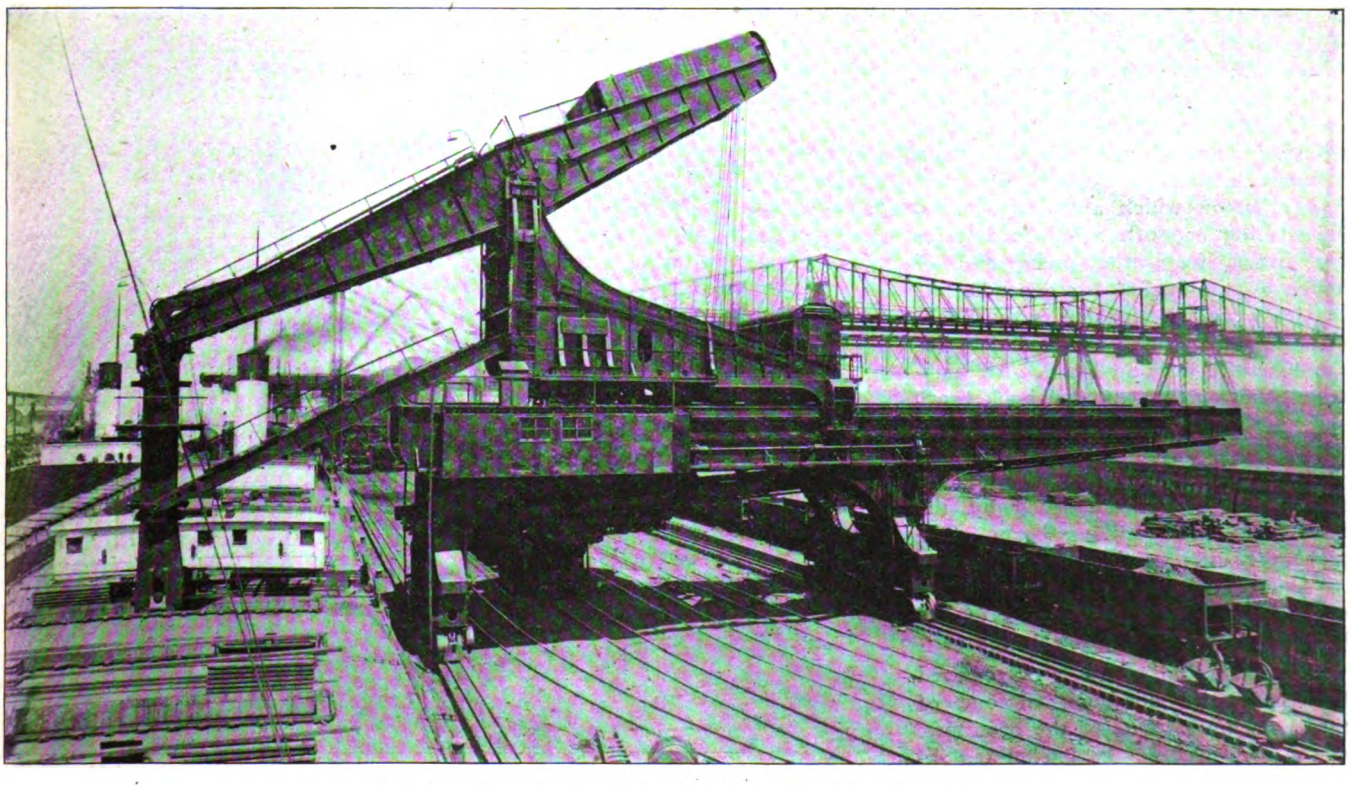


FIG. 1—ORE UNLOADERS AT WORK ON LAKE BULK FREIGHTER

Digitized by Google

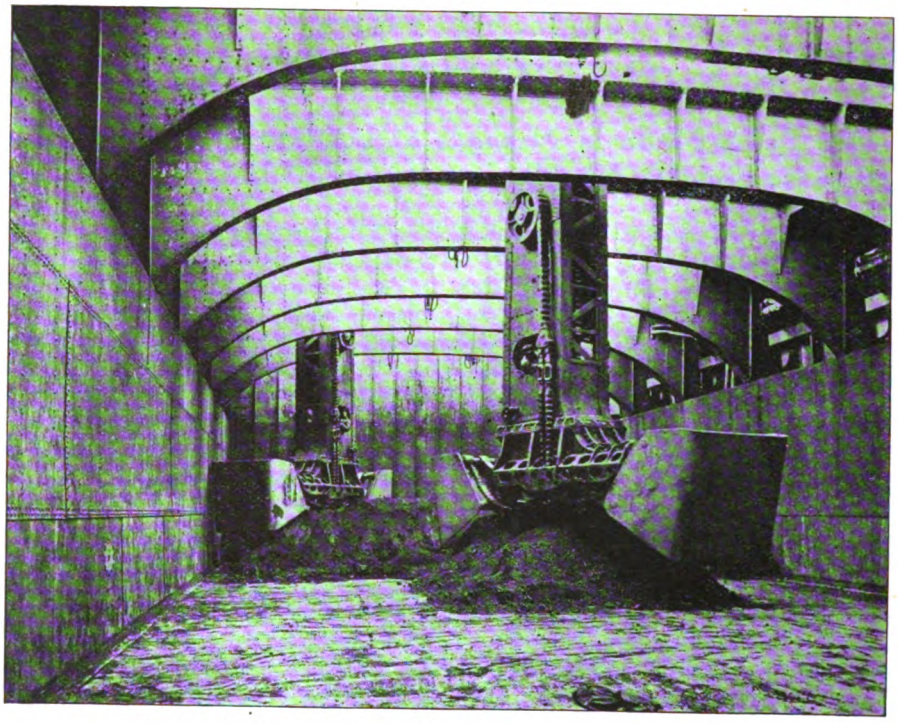


FIG. 2—UNLOADER LEG AND BUCKET IN HOLD OF ORE CARRIER

plified and the control perfected to such a point that the machine is easily controlled and operated.

The unloader consists of a main framework mounted on trucks which travel along the runway rails located approximately as shown in the photograph. The main framework extends back beyond the rear runway over a temporary storage pile where the ore can be discharged if desired. It is then picked up by the ore bridge and carried to the stockpile. Between the front and rear runways, space is provided for railroad tracks where ore carrying cars are placed under the machines and loaded with ore for transportation to the furnace plants. The girders of the main framework form a support for runway rails, on which a trolley travels. This trolley supports a balanced walking beam, from the outer end of which a stiff bucket leg depends. At the lower end of this leg is the bucket, which is operated by machinery located on the walking beam. All horizontal movements of the bucket are accomplished by means of moving the trolley backward and forward on the girders. The vertical movements of the bucket are accomplished by the operation of the walking beam. The forward portion of the beam being out of balance, the bucket descends by gravity as soon as the brakes of the hoisting mechanism are released.

Only two operators are required for the entire operation of one of these machines. One of the operators, whose station is in the bucket leg directly over the bucket shells, controls all of the motions of raising and lowering the bucket, of traveling the trolley back and forth, and moving the machine along the dock from one hatch to another. The second operator is stationed in a cab on the larry and from this station he controls the movement of the larry, the operation of the larry gates, and the weighing of the ore.

Some idea of the capacities for unloading by this method may be derived from a record which was made in Ashtabula, O., by eight machines of this type having a capacity of 15 tons each. They unloaded seven boats having a total capacity of 70,000 tons, in 22 hours actual time. At other points, four machines working in boats having capacities up to 13,000 tons each, have unloaded these cargoes in about 3 hours and 25 minutes.

Cleaning Up a Hold

In addition to the vertical movement, which is given to the bucket leg by means of the walking beam, it also has a motion of rotation around its vertical axis. This motion is introduced to enable the machine to reach along the keel of the boat and clean up ore between hatches. The distance from point to point of bucket shells when open is approximately 21 feet. About 97 per cent of the ore is removed from the boat without hand labor.

Records of 50 machines in operation are said to indicate that this type of machine will handle ore at 2½ to 4½ cents per ton including all fixed charges, and records of as high as 783 tons of ore per hour per machine from tie-up to cast-off of boat have been made.

The Lehigh ore unloader will be installed at the Claremont terminals, New York harbor, to handle Chilean and Cuban ore. A cost of pig iron lower than that based on Minnesota ore is predicted due to economies effected.

A contract with the Western Maryland railroad at Port Covington, Baltimore, covers a Wellman car dumper to handle 100-ton road cars. It is the

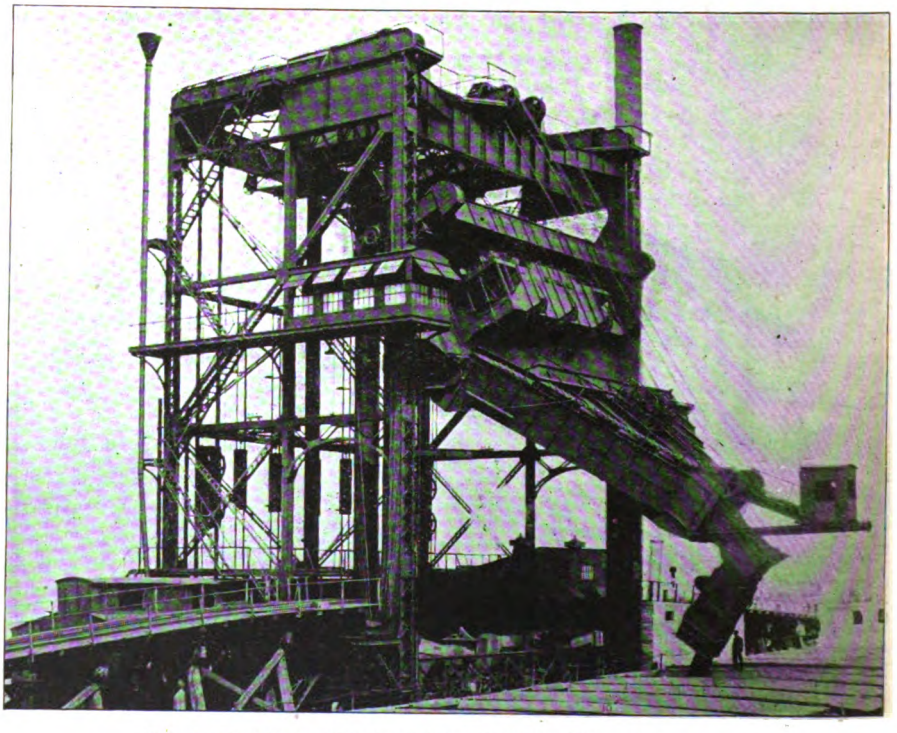


FIG. 3—LIFTING TYPE CAR DUMPER LOADING COAL AT LAKE PORT

Digitized by Google

first electrically operated lifting dumper for seaboard coal loading to be negotiated. The lifting feature is designed to raise the road car high enough before overturning to cause the coal to run down the apron and chute into the ship's hold, as illustrated in Fig. 3. Dumping directly to the ship eliminates breakage and waste due to rehandling. The entire cargo is trimmed without the use of hand labor.

The machine consists essentially of a rectangular framework supporting a rotating cradle in which the loaded railroad car is held while discharging. An entirely automatic counterweight device clamps the car to the cradle which is inverted by the revolving mechanism, carrying the car with it. The top of the cradle forms a chute for directing the material as it flows out.

This installation will have a nominal capacity of 30 to 45 cars per hour of cargo and bunker coal, principally for export. The coal is delivered to the dumper by the Western Maryland railroad from the West Virginia, Virginia and Pennsylvania fields. One million tons will be handled annually with a probable increase to twice that capacity later.

These typical plants indicate the progress of the basic industries, and the gradual elimination of hand labor, which is then diverted to more useful and productive work. These plans also indicate that beneath the surface froth of labor unrest and business uncertainty of the day, there is a constant current of accomplishment and confidence. The former are merely the phenomena of a business cycle; the latter is the country's foundation.

Expect Record Marine Show at Chicago

CHICAGO'S first marine show, which is to be held in the Coliseum the week of Oct. 18, promises to have an even deeper significance than the exposition preceding it last spring in New York. If the plan of the National Marine league carries, the Republican and Democratic presidential candidates will each be given an opportunity in Chicago that week to address the crowds in attendance and explain their stand on the merchant marine problem. The exposition has already received the endorsement of the United States shipping board, which will have an extensive exhibit. The shipping board will display in Chicago the largest relief map of the world ever constructed and a lecturer will be in attendance explaining trade routes, and other matters of interest to shipping men in general. This map was also exhibited at the New York show but it has been promised that the shipping board will display in Chicago many features of its operations that have never before been shown the public.

Promise Variety of Exhibits

Many manufacturers interested in making maritime supplies have already contracted for space, and in addition some of the more important of the American shipbuilders have signified their intention of exhibiting. Among these are the Consolidated Shipbuilding Co., American Bureau of Shipping, New York Engineering Co., Irving Iron Works, and the Submarine Boat Corp. The Westinghouse Electric & Mfg. Co. and the General Electric Co. are also expected to exhibit, as well as All America Cables, Inc. The Crane Co. and a number of manufacturers of hardware and utensils have contracted for space.

The real flavor of the sea will be enhanced largely by the exhibits being prepared for this show by some of the typical American steamship companies. The Munson line and the Luckenbach Steamship Co. have already been assigned space. The American Library association, which is interested in placing sea libraries upon all American merchant ships, will have a booth at the Chicago show.

This show, like the one held last spring in New York, will be under the auspices of the National Marine league and under the management of the General Expositions Co. The Marine league is now preparing a program of public functions to be scheduled for the week as a means of drawing the attention of the public to the exhibition. As announced by the league, the object of the Chicago show is threefold:

First—To focus the attention of the voting population of the Middle West on the great and constantly increasing importance of America's merchant sea power in relation to the maintenance of inland prosperity.

Second—To impress the public of the entire country with the wealth and magnitude of our lake and inland water shipping, to the end that this part of the nation's transportation problem may receive the serious and intelligent attention of both national and state lawmakers.

Third—To provide a market place where buyer and seller of ships, service and marine equipment may conveniently meet and do business.

The more serious problem of the needs of the overseas trade will not be overlooked. In commenting upon this phase of the subject which is to be accented at the Chicago show, P. H. W. Ross, president of the Marine league, said:

"A man who is running a mill or a farm in America and who wishes to have the sale of his product protected to some extent from ruinous foreign competition thinks of the tariff as the only form of protection. He is mistaken.

"When his country is in debt to the rest of the world, the tariff works fairly well, but when his country is a creditor and the rest of the world owes America billions of dollars, then the tariff is but poor protection for two reasons: The rate of exchange runs so high against an overwhelmingly creditor nation that the exchange itself will leap over the highest tariff wall a country could ever erect. Secondly, an outside world that is heavily our debtor, is forced to pay its debts to us in manufactured goods of one kind or another or in raw materials.

Protecting National Prosperity

"These payments 'in kind' fall upon our shores and in a very few years will deluge our country with cheap foreign made goods to such an extent as to swamp the manufactories of Illinois, Iowa, Indiana and indeed the whole country, unless we have ships of our own.

"The one solution to this grave economic problem is American ships. Through them this threatened deluge of foreign-made goods which could wipe out our steady, profitable employment of capital and labor at home, can be stemmed and diverted to new foreign markets. If we are to retain national and individual prosperity and avoid commercial peonage to any foreign nation, we must make a concerted effort immediately to place our great new merchant marine and the enormous industries connected therewith, in a position where they will not again dwindle to prewar insignificance.

"The development of a deep-sea merchant marine is no longer of direct concern only to those states lying on the edge of the ocean. For today all that vast interior region of the country is interested in shipping."

Digitized by Google

Equipment Used Afloat, Ashore

Simplifies Drive In Radial Drill—Pipe Strainer

SEVERAL radical changes from machine tool design have been made in a new line of radial drills recently placed on the market by the Niles-Bement-Pond Co., 111 Broadway, New York. As shown in the accompanying illustrations, the most distinctive feature is the patented double column which adds to the general rigidity of the machine and permits the drive to be so simplified that a higher percentage of the horsepower is delivered at the spindle. The column is a single casting formed of two box section members cast integral at the top and bottom, the arm saddle being mounted between them. The motor is mounted on the back of the arm saddle and drives the spindle through a single horizontal shaft running between the column members, thus eliminating a number of the usual driving gears and shafts.

The arm is easy to swing, the entire weight of the arm and column being supported on ball bearings at the bottom of the column, while side thrust is taken on roller bearings. By means of a motor-operated device the column can be instantly clamped rigidly to the pedestal. An operating switch is placed on the drill head and a lever for hand clamping is provided on base. The electric clamp is operated by a small motor through a worm wheel and nut and is self-adjusting, wear being taken up automatically. As this clamp is operated by electricity instead of air, it uses the same source of power as the driving motor. Therefore, when installing these machines, no consideration need be given to a compressed air supply.

To give proper resistance to the drilling pressure, the arm is of a new section. The most important features are an upper narrow guide for the saddle and the lower bearing set in a plane back of the front surface. This construction brings the driving shaft closer to the spindle and gives a greater depth from the front to the back of the arm, the result being a stiff arm.

The arm is raised and lowered by power from the driving motor operating through the stationary elevating screw and a revolving nut in the arm saddle. Starting is accomplished by engaging the clutch lever located on the driving gear box and stopping by the controller handle on the drill head. To prevent engaging the elevating mechanism while the arm is clamped or vice versa, the two mechanisms are interlocking. Safety stops guard against overtravel.

A most important advantage of the double column construction is that the drive can be made so that only four gears and one double-faced pinion are required from the motor to the spindle. Fig. 4 shows a diagram of the drive. A motor control lever is carried on the head. Eight positive geared feeds are secured by setting a disk showing the feed for each position. The feed change gears, which are entirely enclosed and run in oil, may be removed as a unit. This machine is built in several sizes to meet various specifications.

The Newburgh Shipyards, Inc., Newburgh, N. Y., is planning to erect a steel fabricating shop. It will be a 2-story building of more than double the floor space of the present shop. The shop will be 360 feet long and 120 feet wide, divided longitudinally into two bays. The second floor is to be used as a mold loft with offices at one end. The new building will be con-

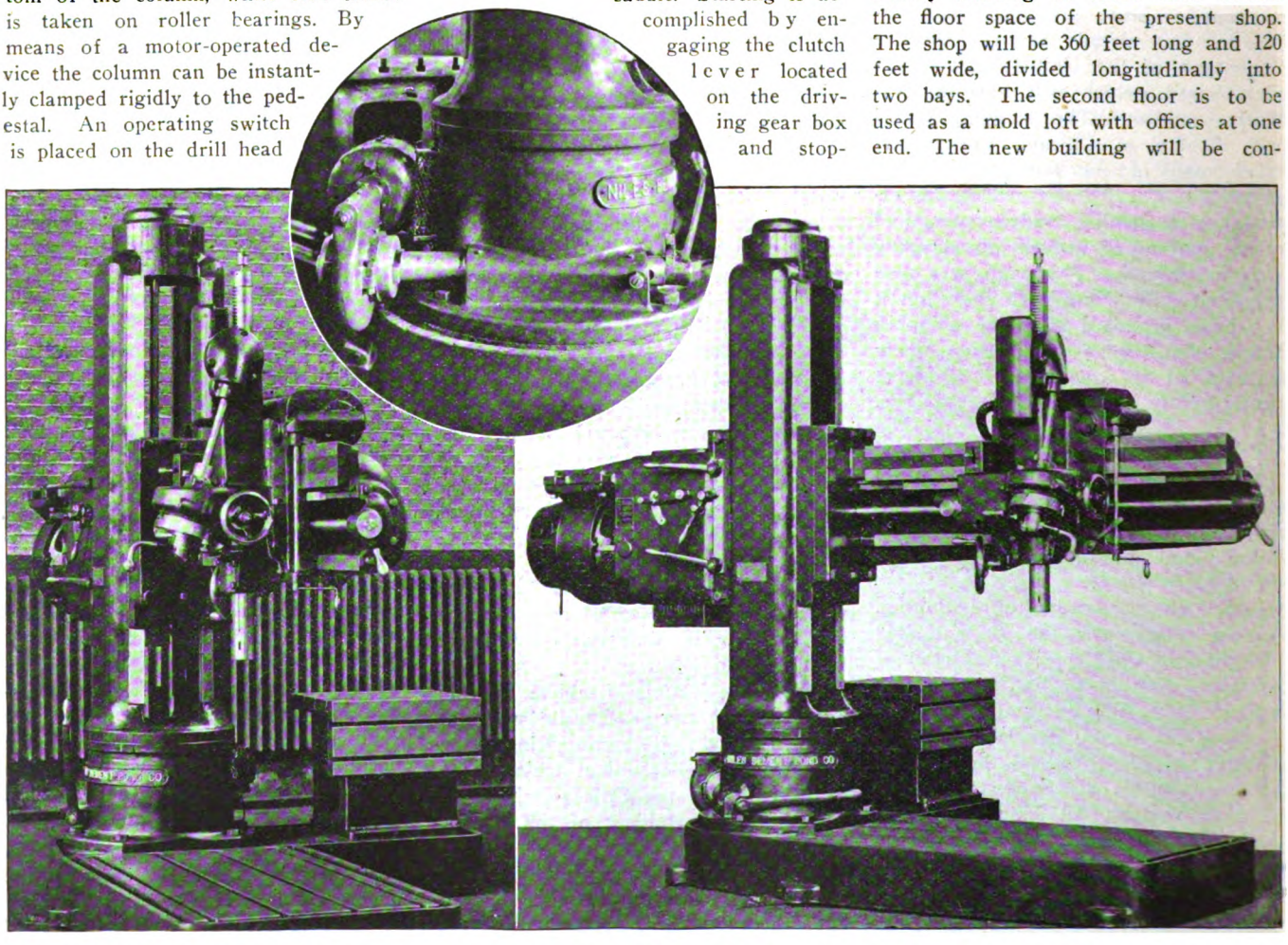


FIG. 1—END VIEW OF DRILL LOOKING THROUGH DOUBLE COLUMN FIG. 2—FIVE-FOOT PLAIN RADIAL DRILL FIG. 3 (INSET)—ELECTRIC COLUMN CLAMP OPERATED BY SMALL MOTOR

Digitized by Google

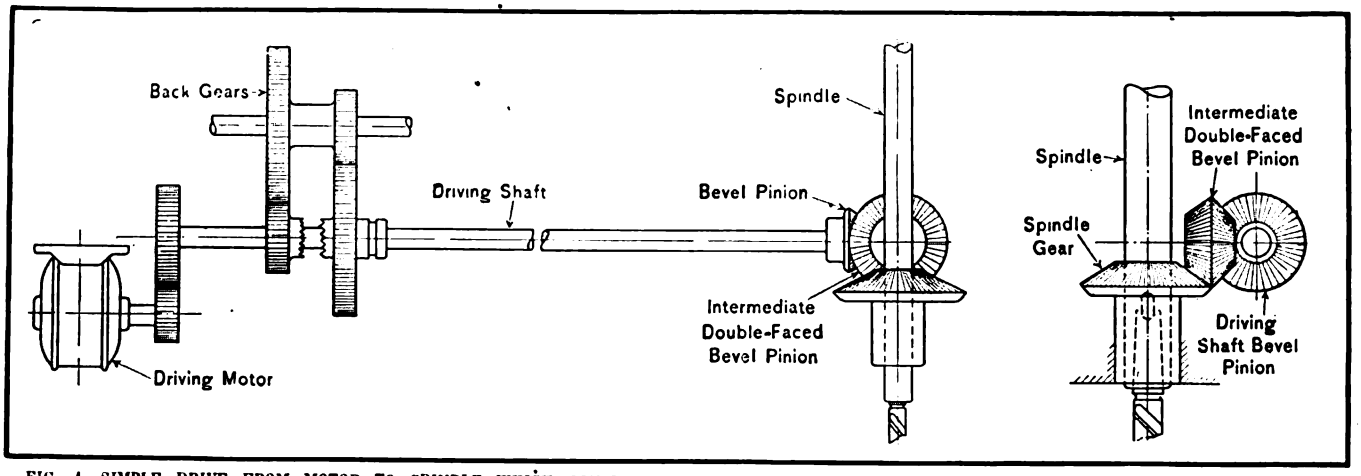


FIG. 4—SIMPLE DRIVE FROM MOTOR TO SPINDLE WHICH CONSISTS OF A HORIZONTAL SHAFT, FOUR GEARS AND A DOUBLE-FACED PINION

structed on the same site and around the old shop.

Late Marine Patents

Copies of any one of the following patents can be obtained by forwarding 25 cents in stamps to Siggers and Siggers, National Union Insurance building, Washington, and mentioning MARINE REVIEW:

1338530—Means for protecting ships, John P. Roe, London, England.

1338706—Protecting device for ships, E. A. Smith, New York.

1338815—Concrete vessel, Lionel Coke-Hill, Montreal, Que., Can.

1338816—Salvage apparatus, Henry D. Beam, Benton Harbor, Mich.

1339293—Ship launching control device, John G. Sjoberg, Oakland, Cal.

1339321—Buoy, William S. Crouch, Tacoma, Wash., assignor to Line Carrying Buoy Co., a corporation of Delaware.

1339372—Protection of ships against torpedo attack, L. E. Whiton, New London, Conn.

1339532—Mechanism for turning ships davits—Axel Welin, London, England, assignor to American Balsa Co., New York.

133928—Automatic ballast shifting device—Howard A. Selah, Newark, N. J., assignor of one-half to Albert C. Pedrick, Newark, N. J.

1339717—Salvaging apparatus—Charles Sanger, Bay St. Louis, Miss.

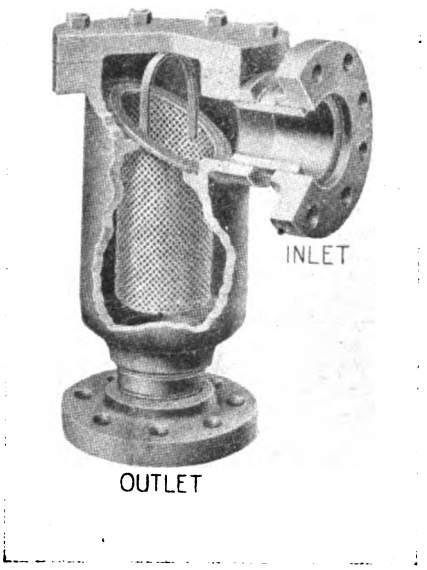
1339755—Ship's hull construction—Fred W. Gore, Huntington, N. Y.

1340002—Anchor shank and shackle—William M. Bateman, Chester, Pa.

1339647—Boat launching apparatus—Charles H. Fuller, Portland, Oreg., assignor to Fuller Davit Co., Portland, Oreg.

1340309—Air navigating vessels—Henry C. Woerz, New York.

1340441—Sheet metal boat or other vessel—William Gardner, Broomhill, Glasgow, Scotland.



SINGLE-UNIT STRAINER

Strainer For Pipe Lines

Strainers are required on the suction and discharge lines of lubricating oil, fuel oil and quenching oil systems, for the removal of solid foreign material in suspension. Also power plants which secure their raw water supply from such sources as rivers or lakes, require strainers to prevent weeds, sticks, marine plants and small fish from entering pipe lines.

For this purpose, the Griscom-Russell Co., New York, has developed the strainer shown in the accompanying illustration. The body is cast iron and the strainer basket of perforated sheet steel, lined with wire mesh when the strainer is to be used on an oil line.

The strainer is of the single type and may be installed either as a single unit, or as a strainer set. This set consists of two strainers connected complete, including two 3-way valves and necessary connecting elbows, unions and nipples. This set permits the cleaning of either of the two units without interruption of the service.

Business News for the Marine Trade

The Newburg Shipyards, Inc., Newburgh, N. Y., has had plans prepared for erecting a fabricating plant. The structure will be two stories, and it is planned to have it ready for occupancy by Oct. 1. The company is completing its last vessel for the Emergency Fleet corporation, and in the future will handle private work.

The Merritt-Chapman Derrick & Wrecking Co., 17 Battery place, New York, has acquired a shipyard on the waterfront at Rosebank, Staten Island, about 250 x 1000 feet. The plant was formerly operated as a ship repair plant by the White estate.

The New Jersey board of commerce and navigation, Trenton, N. J., has granted permission to the Cunard Terminal Corp., 24 State street, New York, to construct a terminal at Weehawken, N. J., utilizing 1100 feet along the Hudson river, in addition to 3900 feet of land, previously obtained by the company. Plans call for the construction of eight piers, two stories, eight 5-story warehouse buildings, each 525 feet wide; 11 main railroad tracks, two switching tracks and two ferry slips. The project with full equipment will cost in the neighborhood of $40,000,000.

The Elliott Bay Shipbuilding Co., Seattle, plans to install new equipment and enter the ship repair business. C. O. Morrow is head of the company.

The plant of the Bertelsen & Peterson Engineering Co., 256 Border street, Boston, manufacturer of marine engines, recently was damaged by fire. The loss was estimated at about $25,000.

The Automobile Boat Co., 407 Shubert building, Philadelphia, is having plans prepared for erecting a plant on Audalusia street. It will be one story, 250 x 500 feet, and will be equipped for manufacturing and assembling. E. S. Napolis is head of the company.

The ship repair plant of James Shewan & Sons, Twenty-seventh street, Brooklyn, N. Y., recently was damaged by fire. The loss was said to be in excess of $100,000.

The Milwaukee Dry Dock Co., Milwaukee, subsidiary of the American Shipbuilding Co., Cleveland, has an improvement program involving an investment of $1,250,000. The program embraces the construction of a new drydock capable of handling vessels up to 625 feet. Work has already started on a new pump house and a new office building. Later on, additional machine shops and auxiliary buildings will be constructed. Work on the new drydock is expected to

Digitized by Google

be started in the fall. Frank W. Smith is general manager of the plant.

The Foundation Co., New York, is said to be arranging for the sale of its shipbuilding plant at Port Huron, Mich. The company purchased the yard during the war and erected additional buildings, including machine shops, etc. The yard includes a drydock and repair facilities, and was operated for this character of work for many years. Since it was purchased by the Foundation company it has been used for building oceangoing tugs.

The Atlantic Ship Service Corp., Newport News, Va., recently was incorporated with a capital stock of $25,000 to operate a shipyard. The company will engage principally in repair work. Frank Richardson is president and H. R. Lackey is secretary.

The Manitowoc Shipbuilding Corp., Manitowoc, Wis., has been organized under the laws of Wisconsin with a capital stock of $1,500,000, by A. L. Nash, Lawrence W. Ledvina and E. L. Nash, all of Manitowoc, and the company will engage in a general shipbuilding, drydock and dockage business. The corporation is formed by interests which have acquired the bulk of the property of the Manitowoc Shipbuilding Co.

The National Oil Co., 621 Mason building, Galveston, Tex., is reported arranging for the establishment of a marine repair works at Galveston, to consist of machine shop, forge shop and other structures. The buildings will be equipped with machinery now in use at the shipyards at Orange, Tex., according to the report.

The Twohy Bros. Co., Seattle, owner of the North Pacific Shipbuilding Co. plant, is said to be considering the establishment of a plant on the shipyard site, for the manufacture of railroad equipment, such as freight cars, gondolas, etc. James F. Twohy is president of the company.

The John Baizley Iron Works, 514 South Delaware street, Philadelphia, is said to have abandoned plans for the construction of a new shipbuilding plant and drydock. The project was estimated to cost in the neighborhood of $6,000,000.

The Sun Shipbuilding Co., Chester, Pa., has started construction on a new wet basin, 960 feet long, with deep water frontage of 385 feet, as part of its expansion program, which will involve an expenditure of $1,500,000.

The Bethlehem Shipbuilding Corp., South Bethlehem, Pa., plans the erection of a 3-story building at its yards on Front street, Elizabeth, N. J., formerly the plant of the Samuel L. Moore & Sons Corp.

The bureau of yards and docks, Washington, plans the erection of a new power house at the government works at Cape May, N. J.

The Amalgamated Scaling Co., New York, recently was incorporated with a capital stock of $100,000, by J. Elligers, G. A. and F. A. Percival, 14 Butler place, Brooklyn, N. Y., to operate a ship construction and repair plant.

At a recent meeting of stockholders of the William Cramp & Sons Ship & Engine Building Co., Philadelphia, the proposed increase in the company's capital stock from $6,250,000 to $20,000,000 was ratified.

The plant of the St. Johns (Fla.) River Shipyard Co. has been sold to the Gibbs Gas Engine Co., which has been building wooden vessels and pleasure craft at its South Jacksonville plant.

Assembly of the big, new drydock of the Globe Shipbuilding & Dry Dock Co., at Fairfield, Md., is well under way. When the six sections of the dock are ready, they will have a lifting capacity of 9000 tons. B. C. Cooke has been elected president of the company.

The Gilray Transportation Corp. recently was organized to engage in a general transportation business by inland water routes to Philadelphia, Wilmington, Baltimore and points beyond. The offices of the company are at 25 Beaver street, New York.

The Fishing Vessel Owners Marine Ways, Inc., Seattle, owning and operating the repair yard on Salmon bay, has decided to build a 40-foot extension to the plant's machine shop and will install lathes and other equipment.

The New Jersey board of commerce and navigation has deferred action on the application of the Luckenbach Terminals, Inc., for several hundred feet of land along the Hudson river at Bull's Ferry. It is understood that the company plans to erect a large terminal for the use of the Luckenbach Steamship Co.'s vessels.

The Rose Castle Steamship Co., Montreal, Que., has been incorporated to build and operate drydocks, shipbuilding plants, etc., with a capital stock of $1,500,000, by Arthur E. Holden, Herbert W. Shearer, Alfred B. Wright and others.

The city government of Camden, N. J., will advertise for bids through George N. Bradley, chairman of the harbor committee, for erecting two warehouses, bulkhead and pier, to be built at the foot of Spruce street, that city. The warehouses will be each three stories, 100 x 500 feet.

The Marine Auxiliaries Co., New York, with an active capital stock of $8000, recently was incorporated to engage in the manufacture of auxiliary machinery for ships, etc., by W. H. Scott, 253 Eightieth street, New York, and others.

The Borough Terminal Co., Inc., New York, shipbuilding and drydock business, recently was incorporated by C. K. McGuire, 203 West Eighty-first street, New York, and others.

Charles E. Egan & Co., New York, have been incorporated with a capital stock of $10,000, to prepare ships for sailing, by J. A. Walsh, T. Niven and C. E. Egan, 283 Garfield place, New York.

The Federal Shipbuilding Co., Kearny, N. J., plans to erect a floating drydock, capable of lifting a 12,000-ton vessel. About $1,500,000 will be invested in the addition.

The Canada River Steamship Co., Ltd., Kingston, Ont., recently was incorporated to build and operate shipyards, drydocks, etc., with a capital stock of $1,700,000, by Harold Fisher, L. P. Sherwood, Stanley M. Clark and others.

Sorrentino Bros. & Co., New York, ship cleaning, recently were incorporated with a capital stock of $25,000, by A. E. Rahm, T. and C. Sorrentino, 1125 Forty-first street, New York.

The Trans-Marine Motor Corp., New York, recently was incorporated with a capital stock of $100,000, by O. Sperling, J. A. Lee and G. Pfeil, 149 Broadway, New York.

The Harbor Scaling & Paint Corp., New York, recently was incorporated to do ship repairing, with a capital stock of $5000, by M. C. Ochs, C. E. Milbury and J. Sullivan, 21 State street, New York.

The Northport Shipyards, Inc., New York, recently was incorporated with a capital stock of $100,000, by H. E. Bogdish, M. D. Flomenhaft and G. N. Dorney, 244 West 134th street, New York.

Capitalized at $150,000, the Jacksonville Port Development Co. recently was incorporated in Delaware, by William F. O'Keefe, E. E. Aberle and S. L. Mackey, Wilmington, Del.

The Fort Steamship Co. recently was incorporated in Delaware with a capital stock of $136,000, by T. L. Croteau, M. A. Bruce and A. M. Hooven, Wilmington, Del.

Business Changes

Martin & Gardner, New York, naval architects and appraisers, have opened offices at 1015 Carondelet street, New Orleans, in charge of William B. Ferguson. The company has taken charge of all vessel surveys at gulf ports for the shipping board and for American marine insurance companies.

The New York, New England & Pennsylvania Lighterage Co. has established a branch office in Philadelphia for handling general lighterage and transportation in the harbor of Philadelphia and vicinity.

The chartering department of Davis & Gilchrist Inc., New York, has become sole representatives in the United States for McGregor, Gow & Holland, Ltd., Fenchurch avenue, London.

The Wilson Welder & Metals Co. and the Wilson Welding & Repair Co. have removed their offices from 2 Rector street, New York, to 253 Thirty-sixth street, Bush terminal, Brooklyn, N. Y., and 263 First street, Jersey City, N. J., respectively.

The Titusville Forge Co., Titusville, Pa., has opened a sales office at 1836 Scranton road, Cleveland.

The publicity department of the Chicago Pneumatic Tool Co. is now located in the Chicago Pneumatic building, 6 East Forty-fourth street, New York.

The Moore & McCormack Co., New York, has opened an office at Gothenburg, Sweden, under the name Aktiebolaget, Moore & McCormack.

Swayne & Hoyt, San Francisco, and the J. H. W. Steele Co., New Orleans, are to be the managing agents of the new shipping board freight service from New Orleans to the Pacific coast via Colombian and Central American ports.

Hind, Rolph & Co., New York, have become general agents for the Rolph Mail Steamship Co., San Francisco. John Bloomer is traffic manager.

The Quaker City Steamship Co., Philadelphia, has opened an office in the Board of Trade building, Norfolk, Va., to act as general steamship agent and bunker supplier and to furnish coastwise transportation, steamship and barge service. Capt. Inslee T. West is in charge.

The firm of Duncan, Jackson & Duncan, New York, has been reorganized as Duncan & Duncan, Inc., and will continue as marine insurance brokers and adjusters.

A. C. Elliott & Co., ship agents and forwarders, New York, have established a branch office in the Virginia National Bank building, Norfolk, Va.

The Charles T. Megee Co., Philadelphia, has become agent at that port for the vessels owned by James W. Elwell & Co., New York.

Lane & Brussel have taken over the export freight forwarding business of Collins, Lane & Moore, New York.

The firm of Martin & Gardner, New York, has established a branch office at Seattle, because of its contract to survey United States shipping board vessels. The district comprises Washington and Oregon. David C. Young is in charge.

The Oxweld Acetylene Co., New York, has established Pacific coast sales and distributing headquarters at 1077 Mission street, San Francisco. Lee Romney is Pacific sales manager. Additional sales representatives' offices are located at 646 Maple avenue, Los Angeles, 908 Kearns building, Salt Lake City, Utah; 90 First street, Portland, Oreg.; 433 Pioneer building, Seattle.

The Italian Star line has moved its offices from 405 Lexington avenue to 44 Whitehall street, New York.

New Trade Publications

WINDLASSES—Spur geared windlasses manufactured by the S. Flory Mfg. Co., Bangor, Pa., are described and illustrated in a small pamphlet now being distributed. In designing these windlasses, several innovations in the details of construction were introduced. The company aimed to construct a windlass to withstand heavy duties but at the same time permit ease of handling. Steel gears with machine cut teeth are used. All levers and handwheels for operating the reverse valve and brakes, are on the aft side of the windlass. The gears are proportioned to obtain the required pull at a speed of about six fathoms per minute.

WELDING AND CUTTING.—The Oxweld Acetylene Co., Chicago, is distributing a new catalog. This is issued in sections, each devoted to a particular phase of equipment such as welding and cutting, blowpipes, regulators, accessories, etc. These products formerly were manufactured by the Prest-O-Lite Co. The Oxweld company took over the production and sales early in 1920, incorporating certain improvements in design lately developed in oxy-acetylene engineering.

Digitized by Google